Spring 2000

The Development of a Safety Self-Assessment Tool for the Printing Industry

John Lawrence Grahek

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by

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A Thesis Submitted to the Faculty
Of the College of Graduate Studies
At Georgia Southern University
In Partial Fulfillment of the
Requirements for the Degree of
Master of Technology
In the School of Technology

Statesboro, Georgia
May 2000

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I would like to thank Walter Lewis for giving me the inspiration and desire to provide a tool that the printing industry can use to assess their safety programs. I want to thank my wife Theresa for all her patience and support throughout the whole master's endeavor.

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CHAPTER I

Introduction to the Study

Introduction

Due to the technological advancements of our society, governmental regulations have greatly affected the manner in which employers address safety issues (Jeffress, 2000). The evolution of governmental agencies has had a major impact on organizational effectiveness (Kroll, 1997). One such agency is the Occupational Health and Safety Administration (OSHA). The presence of OSHA has resulted in a new emphasis on employees' safety and well being (Jeffress, 2000).

There are many safety issues to be taken into consideration when operating a manufacturing enterprise. An increasingly common issue is the cost of safety and compliance. An example of the benefits, which can be gained from adhering to OSHA guidelines, is found in a report by Liberty Mutual Risk Services (1993). According to Liberty Mutual, a client was incurring annual worker's compensation costs totaling over $100,000 before implementing a structured safety program. Following the program implementation, compensation costs fell more than $80,000. This is an example of how Worker's Compensation costs and government levied fines can have a major impact on an organization's profitability (Murray,1994; Jeffress, 1999).

Due to the fact that failure to adhere to a safety program can greatly affect an organization's success, safety awareness is practiced by most competitive companies (Murray, 1994; Jeffress, 1999). There arises the issue of a non-productive injured worker and the impact that it has on a

plant's performance. Governmental regulations play a major role in established safety programs and in cost containment. Companies that operate with unsafe conditions can be subject to costly fines from OSHA (Murray, 1994; Jeffress, 1999).

According to Friend (1994), a formal written safety program can provide a road map to follow when trying to maintain a safe and harmonious work place in a company. Many smaller organizations neglect safety awareness and compliance although it is an issue of extreme importance. In the past, a predominant attitude among smaller companies has been that safety issues pertained only to larger companies. It is apparent to those in the field that an accident can occur at any place at any time within large and small businesses alike. A formal safety program can only benefit an organization's success and growth by reduction in losses and the costs incurred from them.

The growth of the printing industry is increasing rapidly, whether it is in the area of Lithography, Flexography, Gravure or Letterpress (Envirosence, 2000). Many smaller printers are growing into profitable organizations with increased employment and plant expansions. Along with this growth, employee exposure to chemicals and solvent vapors increases (NIOSH, 1999). Thus, it is critical to have a safety program in place for companies to strengthen their procedures and practices (Bhimavarapu and Hovsepian 1998). Self-assessment is a means for identifying areas that are in need of attention in a plant. Likewise self-assessment would identify areas that a printing company should address to be in compliance of OSHA standards. This study was designed to be a guide to assist printers in understanding the importance of having an effective safety program and provide a tool to improve their existing compliance program. The study also answers commonly asked questions, which arise when conducting a safety audit.

Problem of the Study

The problem of this study was to develop a self-assessment tool that would enable printing industry management to audit safety program compliance to OSHA standards.

Sub problems

The following sub problems were associated with the purpose of this study.

1. Identify and develop an auditing tool to assess a safety program.
2. Identify and develop a measurement system to rate safety program effectiveness.

Statement of the Need for this Study

This study will develop a self-assessment tool to evaluate the effectiveness of safety programs in the printing industry. The format of the tool used to evaluate the strength of safety programs is a self-auditing process.

Controlling a safety program is no different than controlling any other part of a company's operation. The most meticulously planned and organized safety program is ineffective unless adequate attention to a control function has occurred (Greenburg, 1982). Effective safety programs rest heavily on one control function: a formal safety audit. The use of the term audit denotes that a more thorough examination of the conditions of a safety program is in place, rather than a spot inspection. The auditing process is a managerial responsibility, and helps to ensure that the safety program is properly functioning.

Towne (1994) defines a safety audit as an assessment tool to assist in determining the effectiveness of a safety program. The audit can be used to help with an organized assessment to determine a safety program's annual progress. The audit should be used to evaluate the program, not the people involved in the program.

An audit, such as the one developed for this study, determines the status of a safety program, emphasizing two essential aspects. The first aspect is the formulation of a structured system that involves developing formally written programs and procedures. The second aspect is the implementation of those systems within a facility. These two aspects confirm a closed loop system within a facility's safety program (Towne, 1995).

Assumptions

This study incorporates the following assumptions:

1. All printing companies, large and small, subject to OSHA regulations can use the same assessment tool in evaluating their safety programs.
2. The panel of expert evaluators that evaluated the self-assessment tool for content and face validity was representative of the printing industry.
3. There are not self-assessment tools readily available for the printing industry to use to evaluate their safety program.

Limitations

This study contains the following limitations:

1. This study was limited to printing industry management and delt with OSHA compliance and safety programs relating to their manufacturing processes under the General Industry clause.
2. This study was limited to OSHA regulations. This involved the Code of Federal Regulations Part 29 labor.
3. The study was limited to segments of a formal safety program and how effective it is for the printing industry.

4. This evaluation of the assessment tool was limited to evaluation by a panel of experts composed of professionals in the following fields: printing industry management, Occupational Health and Safety Administration, risk/management insurance, and education.

Definitions

This study utilizes the following definitions of important terms:

OCCUPATIONAL SAFETY and HEALTH ADMINISTRATION (OSHA) - an organization evolved from the 104th Congress that deals with employee and employer safety (Code of Federal Regulations, 1998).

ENVIRONMENTAL PROTECTION AGENCY (EPA) - government organization that deals directly with the protection of our environment (Code of Federal Regulations, 1998).

CODE of FEDERAL REGULATIONS (CFR) - Part 29 Labor deals with all the laws established by OSHA and the employer's responsibility to maintain these laws (Code of Federal Regulations, 1998).

COMPLIANCE - The act of conforming or agreeing with, such as being compatible with the law (Webster 1982).

REGULATION - A managed system aimed at not violating a standard or rule (Webster, 1982). An example would be an enforced OSHA law that employees are trained in its implementations and it's ramifications.

SELF-ASSESSMENT TOOL – A device used by an organization to assess their current safety systems or programs, insuring a productive atmosphere and compliance with national laws (Greenburg,1982).

Procedure for the study

The problem of this study was to develop a self-assessment tool that would enable printing industry management to audit safety program compliance to OSHA standards.

1. Professional journals, other library sources, the Internet, and OSHA guidelines were used to gather relevant information.
2. A self-assessment tool developed by Tyco International was used as a model for the development of the new assessment tool. The Tyco assessment tool was chosen because of the content and details to the systems approach to safety. This assessment tool has been in use in all facets of manufacturing including printing, printed circuits, fiber optics, textile, and heavy manufacturing.
3. A selection of completed self-assessment tools from various industries was used to compare the contents of the new assessment tool.
4. A formal review of the self-assessment tool by a panel of experts was implemented using the Delphi Technique. Recommendations from this panel were taken into consideration and their unanimous approval demonstrated validity.

Summary

Due to the financial impact of injuries and penalties for non-compliance of OSHA standards, American businesses are making compliance a necessity in plant operations. Businesses must establish and implement effective programs and procedures to ensure compliance. Everyone in an organization has a responsibility to contribute to compliance with safety programs. This is more easily accomplished if a business has reviewed OSHA standards and has developed a guide and training tools necessary to sustain compliance. The purpose of this study was to develop a self-assessment tool that would enable printing industry management to audit safety program

compliance to OSHA standards. This tool makes it possible to identify deficiencies and improve safety programs. The purpose of the tool was not only to assist businesses in complying with OSHA regulations, but also to have total plant involvement in the safety effort.

CHAPTER II

Review of Related Literature

Introduction

The content of this chapter will discuss essential areas that impact an organization's safety program. A review of the literature will provide information on why there is a need for a formal safety program and an assessment tool to evaluate the programs effectiveness. The areas that will be discussed in this chapter will include the governmental regulations and a review of case studies on OSHA and EPA violations. This chapter will also discuss the role managers play with the safety effort, and the assessment of a safety program for effectiveness.

A review of the literature confirms a need for a formal self-assessment tool for assuring compliance to government regulations. Numerous studies demonstrate that employee safety should be a major concern of any employer and safety compliance should be part of it (Thygerson, 1972; Greenburg, 1985). A method of performing a self-assessment allows an organization to review the status of the safety program and its effectiveness (Thygerson, 1972).

Ronald Pruett (1995) queried in an article entitled, "Safety with a Competitive Edge", "What would happen to the bottom line if the same energy spent on quality programs, benchmarking, and re-engineering was applied to global safety?" Pruett indicated that the rewards of an effective safety compliance program are virtually universal. The increase of workforce productivity and decreased downtime has an astronomical cost impact. Yet another benefit can be found in improved corporate names and images, which results from a responsible and concerned employer.

Finally, the relationships that are developed between the local regulators and businesses are more productive in assisting with compliance. In a competitive global environment, industry must collect the dollars saved by having workplace safety programs and procedures to maintain their strength for future growth.

Greenburg (1985) described a self-assessment tool as a device to help an organization convey the safety message to employees, maintain a productive atmosphere, and assure compliance with national laws. Certain standards of measurement controlled by management are included in a self-assessment tool. Two measures of performance are the ratios of "accident frequency" and "lost workdays resulting from the injuries." The impact of worker compensation costs directly influences insurance claims. This is another reason to utilize a measurement tool to control the costs of non-compliance.

An example of a corporation reaping the rewards of compliance is illustrated in John Deere's 1992 annual report:

> Deere continues to be a leader among U.S. industry in occupational safety. Fifteen John Deere facilities, marketing, and administration facilities won National Safety Council performance awards. Employee injury and illness rates were reduced by 93 percent since 1975, when the companies occupational health and safety programs were put in place. This represents an estimated 263 million in workers' compensation cost avoidance during this seventeen year period.

John Deere was able to maintain an effective safety program, in part, using self-assessment.

Legislation

The inception of safety legislation in the United States began when Congress passed the Occupational Safety and Health Act (OSHAct) in 1970. There was an obvious need for federal legislation to prevent injuries and illness in the work environment. The accident rate was increasing across the nation. Illness in the workplace was rapidly increasing and affecting employee performance. Employers did not see the financial incentive to address safety and health. Efforts made by state organizations toward workplace safety were not having an impact on manufacturing firms. (MacLaury, 1981; Jeffress, 2000).

Willard Wirtz, a strong advocate of workplace safety, was the Secretary of Labor in 1968. He increased awareness of industrial hazards by speaking of the astounding casualty rate in the workplace. Employees were working at jobs sites where accidents resulting in injuries, dismemberment, and death occurred. Wirtz demanded that Congress put a stop to the carnage that was occurring. Due to the efforts of Wirtz and others, the OSHAct was passed. The 91st Congress will forever be remembered as the Occupational Health and Safety Congress (Mintz,1984).

The structure of the present day OSHAct is changing every day due to the new laws that are being developed and the old laws that are being updated. The following covers the basic structure of OSHA (Mintz, 1984).

Universal coverage: Universal coverage applies to all private federal and state employers who are not covered by approved plans under other agencies.

Employer obligations: The employer's obligation is to provide safe and healthy working conditions as set forth by the standards that have been developed by the federal government.

Enforcement: The OSHAct is enforced through inspections of the workplace and citations for noncompliance of safety standards. The goal of the enforcement is to have the employer take a proactive approach to workplace safety and accident prevention.

Education: OSHA has the authority to insist that employers educate employees on workplace hazards and safety standards. OSHA can also work as a consultant with the employer aiding in solving issues that deal with safety. OSHA will work as a partner with organizations in helping develop a safe and healthy workplace.

Employee participation: OSHA was developed to protect workers. The statute gives employees a chance to play an important role in ensuring they are safe when at work. OSHA encourages employees to call for an inspection if an unsafe condition exists in their work environment, and protects employees from any kind of repercussions that may arise from them doing this. In addition, an employee has the right to know of any workplace hazards they may encounter. This includes unsafe conditions or materials that they work with.

Under the General Duty Clause of the OSHAct it states "…the employer is to provide to the employees a place of employment that is free from recognized hazards that are causing or likely to cause death or physical harm to its employees." Along with this, the regulation states that the employer must comply with occupational safety and health standards promulgated under this act (Code of Federal Regulations, 1998). The employee must comply with all occupational safety and health standards as well as all rules, regulations, and orders that are involved in this act that are applicable to their own actions and conduct (Code of Federal Regulations, 1998).

A Review of Related OSHA Violations

As the following case studies demonstrate, the cost of compliance usually outweighs the heavy fines that can be levied on a company by OSHA or EPA. A coastal Georgia paper company experienced an OSHA visit that ended up costing the company thousands of dollars. Gilman Paper Company of St. Marys, Georgia was cited for alleged violations of the Health and Safety Standards. The citations carried penalties totaling $124,500. A total of fifty-six violations were found, including but not limited to inadequate hazardous waste emergency response procedures, inadequate confined space program, lack of proper respirator program, deficiencies in the Chemical Hazard Communication Program, unguarded saws and machinery, and electrical hazards (ELB, 1994).

Utilizing a formal written safety program could have prevented the majority of the violations. Having a written program as a training tool for the employees at the paper plant could have saved the company money. An OSHA inspector who spends time looking at an adequate safety program will be more confident with the total operation. As a result, the inspector may believe a tour to be unnecessary (Williams, 1994).

According to the Photo Marketing Association (1992), between 1991 and 1992, a variety of photo labs were inspected, ranging in size from small to extremely large shops. OSHA found numerous violations within this industry. The most frequently cited violations lay within the areas of written programs. Standard 1910.1200, the written hazard communication plan, had over 5,000 violations. A hazard communication plan requires the printers to develop and maintain a written safety program. These programs must include employee training and identify people in charge of training the employees on chemical hazards. In addition, the program must include the proper

material safety data sheets for chemicals used in the plant, chemical labels, chemical warnings and other emergency plans.

A violation that resulted in over 3,000 employers being fined was OSHA standard 1904.2(a) OSHA Log200. This standard requires the employer to maintain a log of all recordable occupational injuries and illnesses that occur on the job.

OSHA standard 1903.2(a), which is the Posting Notice Act Availability, resulted in over three thousand violations also. This standard requires the employer to post the obligations from the Williams-Steiger Occupational Safety and Health Act of 1970 in areas where the employees can see them. This posting informs the employees what the employers' responsibility to workplace safety is.

Over 2,000 employers were cited for violating Lockout Tag/out standard 1910.147. OSHA requires employers to maintain a written program for the employee training on the use of lockout devices whenever a machine is worked on where potential injury could occur. This includes machines that could store energy from air, hydraulics, or electricity. The employer is responsible for issuing locks to the employees that would be involved in the lockout process as well as follow up inspections.

Violations of Machine Guarding standard 1910.212(a)(1) resulted in over one thousand citations. This standard requires the employer to have adequate guards in place on machines where employees could become injured either by pinch points or nip points. Types of these guards are barrier guards, two handed trip buttons, and electronic disconnecting devices.

Section 5A.1 of the Occupational Health and Safety Act is the General Duty Clause. Over one thousand employers in the photo finishing industry were cited for violations of this clause,

which states that employers must follow all applicable rules outlined by OSHA. This clause can be interpreted in many different ways by an OSHA inspector depending on how they want to handle it.

Benefits of OSHA Compliance

Joseph Dear, Assistant Secretary of Labor for the Occupational Safety and Health Administration (OSHA) to the House of Representatives Subcommittee on Labor Standards, and OSHA on Education and Labor, said that the Department of Labor supports the requirement for employers to have a written safety and health program (Dear, 1994). Employers and employees must have greater involvement in identifying and abating safety and health hazards. The purpose of such a program is to identify and fix hazards before workers become sick or injured. The value of workplace safety programs has been widely recognized by forward-looking companies who have had success in programs related to safety, quality control and other areas in production (Dear, 1994).

Dear notes that the Insurance Information Institute has provided us with numerous examples of organizations who not only protected their work force from injury with a formal written program, but realized a great savings from Workers Compensation Costs and gains in workplace performance. Atlantic Mutual Insurance company reported that one of their policy holders, an aluminum window manufacturer, reduced the total number of compensation claims by fifty percent between 1990 and 1992 and reduced the cost of claims by eighty-nine percent. The savings were realized after the company adopted a formal written safety and health program (Dear, 1994).

Dear went on to say that in a nation of almost six million employers, there is no "one size fits all" approach to safety. Employers and employees must be encouraged to tailor their programs to fit their special needs (Dear, 1994). Because of this, OSHA provides flexibility to fit the needs of all different types of industry. This is why an industry such as the printing industry would have special

emphasis in areas of health and safety different from a heavy metals industry. A case study done by Safety Management magazine found that a New Jersey firm cut their Workers Compensation cost seventy-five percent by implementing a comprehensive safety program. According to Bill Murray, Safety Coordinator at Christian Salvesen's Incorporated, the new program dramatically cut costs and made the plant safer (Murray, 1994).

Four years ago, Christian Salvesen had numerous accidents resulting in high insurance cost in their operation. They decided to develop a comprehensive safety program that was aimed to productively prevent accidents. This program included a combination of training, reinforcement, and discipline. The program involved annual training in critical safety areas such as forklift operations and machine guarding. Continual reinforcement of safety policies and procedures were documented and made available for everyone in the organization. Disciplinary action was enforced when gross neglect of the employee occurred. These actions improved the safety of all employees and also demonstrated that management was serious about their safety (Murray, 1994).

Environmental Protection Agency (EPA)

Legislation enacted in the 1970's addressed yet another component of safety in the workplace, the protection of the environment and our natural resources. The constant mismanagement of handling waste is destroying our household drinking water and the air we breathe. Dumps have received toxic waste from chemical manufacturers, de-leading manufacturers, and other processing plants. Emissions from factories have had a detrimental impact on the atmosphere. The lack of control of this situation triggered the development of the Environmental Protection Agency. Prior to the onset of governmental regulation of waste management, managers of the generator companies did not want to take the time to train employees on the proper handling of the hazardous waste, so nothing was done. Once the EPA

became involved and levied heavy fines on companies, this attitude started to change (Traverse, 1991). The evolution of the EPA gave further support to the practice of employee training and awareness.

The consequences of careless waste handling became evident in the following case study. A federal judge in Florida sentenced two managers of a company to over two years in prison for illegally dumping hazardous waste (Georgia Environmental Law Letter, 1994). The plant manager and the shop supervisor were sentenced to twenty-seven months in prison for dumping the hazardous waste Toluene in an illegal area, subsequently causing the deaths of two young boys. The Durex Company, a manufacturer of rollers for the printing industry, used the solvent Toluene to clean the rollers and other parts of the machines. The company would routinely take the solvent and dump it on the ground or in a dumpster despite the orders from the local environmental regulators and guidance from chemical distributors. It was recorded that the company dumped five to seven gallons of Toluene in a dumpster on the plant grounds. Next to the plant was a lot where the two boys played regularly. They went to the grounds of the plant and climbed into the dumpster where the used solvent had been disposed. They inhaled the toxic fumes of the solvent, and the two boys died the next day. The two managers from the company were indicted on two counts: Illegally treating, storing, and disposing of used Toluene for over a year's time, and of knowing endangerment by dumping the Toluene into the dumpsters. The company pleaded no contest to the two counts. The company could face fines up to $1.5 million dollars (Georgia Environmental Law Letter, 1994).

Resource Conservation Recovery Act (RCRA)

The EPA and OSHA are separate organizations, which work closely together in pursuit of their common goal, which is to protect the environment and its inhabitants. In 1976, the Resource

Conservation Recovery Act (RCRA) was written, and was finalized in 1980. RCRA is a comprehensive written regulation that covers a number of technical and legal areas. RCRA places strict discipline on the handling, identification, transportation, and disposal of hazardous wastes.

The RCRA can have a major impact on any organization. An organization is responsible for the hazardous waste they generate from the start (conception) to the finish (disposal). This is often referred to as the "cradle to grave liability." If there is ever an incident where someone or something is effected by the hazardous waste, the top managers and crew leaders will be held liable. This is why strict control of the handling and transportation of the waste is so important. Procedures should be written and follow up audits should be conducted on the proper handling of the waste. These measures should be in place to leave no doubt as to how the material is being handled (Traverse, 1991).

Like OSHA, RCRA inflicts heavy fines and jail sentences upon persons who improperly manage hazardous waste. Fines can be as high as $50,000 per day per offense. Jail sentences of up to five years are possible for serious or repeat violators. The leader of the organization or the owner of the land is held accountable for any non-conforming regulations, as opposed to the employee handling the waste. If the hazardous waste is sent out of the plant, the generator is still responsible for the waste. Therefore, if it goes to an area where it contaminates the drinking water or the ground, the first user of this waste is responsible for it and is responsible for cleaning up the waste. This is why training is so important for the employee who handles the waste (Traverse, 1991).

In 1984, an amendment to the Resource Conservation Recovery Act was created, resulting in the Hazardous and Solid Waste Act. This act covered landfill bans for certain hazardous waste, treatment standards for landfilling wastes, laws for underground storage tanks, and fuel blending

requirements. The handling and disposal of hazardous waste is becoming a process that must be managed with extreme care. A list of known hazardous waste is made available for review by the EPA so organizations know whether or not they may be generating hazardous waste (Traverse, 1991).

Clean Air Act

From the time of its inception in the early 1960's, the Clean Air Act has been continuously evolving. It was designed to protect the atmosphere in which we live by controlling the amount of emissions coming from automobiles and heavy industry. This initial legislation put a limit on the amount of chemicals used in industry that can be emitted into the air.

In 1990, President George Bush enacted additional legislation to the Clean Air Act in order to provide more control over air pollution. The new laws also provided for the development of environmental policies and regulations that would assure cleaner air for all Americans (Keller, 1994). The new amendments to the act served to encourage the use of cleaner fuels, such as cleaner coal and natural gas as a substitute to high sulfur coal. Overall, the additions to the Clean Air Act progressively promoted energy conservation (Keller, 1994).

Clean Water Act

The Clean Water Act deals with all aspects of water pollution in the United States and it serves to assure safe water for all Americans. The act contains regulations covering ground water, storm water, safe drinking water, wastewater, and pollutant discharge in the country (Keller,1994).

The most recent addition to the Clean Water Act is the stormwater regulation found in 40 CFR part 122. This regulation was passed in November 1990 and effects 173 cities, 43 counties and as many as 100,000 industrial facilities. Under these regulations, industries are required to have a National Pollutant Discharge Elimination System (NPDES) permit for their storm water

discharge. There are three different permits available: group, individual, and general permits (Keller, 1994).

Group Permits: Group permits allow facilities that are part of the same guideline subcategory to submit a single application. Companies must be in the same Standard Industrial Classification (SIC) code, but they do not have to be owned by the same parent company. The NPDES form is required for all facilities. The group permit has two parts. The first part deals with a justification of why the participants qualify as a group. If the justification is approved, then the second part is submitted, which deals with quantitative data. Only 10% of the facilities within a group have to supply this data on waste handling procedures (Keller, 1994).

Individual Permits: This permit is for individual industries that decide to file independently or have been disqualified from the group permit. NPDES forms are required for this permit and only EPA regional offices or NPDES approved states can issue these permits. Every stormwater discharge location must be tested, unless the EPA approves smaller sampling.

General Permits: The general permit is available to the seventeen NPDES approved states and is issued by the EPA. While the general permit covers the entire industrial category, each user must submit a notice of intent to be covered. The Notice of Intent form is published in the Federal Register as of September 1992. The regional permitting agency provides assistance to companies who wish to obtain this permit. The general permit requires industries to develop a pollution prevention plan and annual inspection requirements that vary from industry to industry. Mining operations and construction sites are effected by this regulation as well (Keller, 1994).

Safety Effort within the Workplace

Thygerson (1972) gives a number of reasons for safety in the workplace, such as avoidance of injury or pain, inconveniences, and material loss. The common factor behind these reasons is that

they involve people, who are the greatest asset in any organization. When an employee is injured on the job, questions should be asked about the prevention of future accidents. There is a cause for every accident, therefore it should be possible to prevent accidents by identifying potential hazards. The need for training and education of the employee is essential. One factor of accident prevention entails an employee's awareness of his or her surroundings. A manual or guidebook is a quintessential aid in the education of employees (Thygerson, 1972; Helmer, 1999).

In 1970, the National Safety Council stated that the accident situation in the United States was grim (National Safety Council, 1970). It is fair to say that without organized safety efforts and safety education, America's accident record would be even more shocking than it already is. Since the inception of OSHA in 1970, fatalities and disablement's occurring on the job have reduced in number (U.S Bureau of the Census, 1997). It is difficult to define every event that is called "an accident." One definition reads "An accident is an unplanned event frequently leading to undesirable effects (National Safety Council, 1970)." Accidents are the fourth principle cause of death in the United States, following heart disease, cancer, and strokes. Accidents are also the leading cause of death among persons aged one to thirty-seven. Every year in the United States the National Safety Council reports approximately 115,000 deaths due to accidents. This works out to one death every five minutes. Eleven million injuries are reported annually (National Safety Council, 1970).

An accident or injury can have a great financial impact on an organization. According to the Board of Workers Compensation, an employer must pay for any fees involved with a work-related injury. Due to the employer's liability, the rising cost of health care can effect the profitability of any organization. An accident prevention system needs to be in place to preserve the talent of the

organization. This is yet another reason why a formal written safety program is necessary for workplace safety.

An article in Industrial Hygiene Safety and News (Daughty, 1994) discussed the importance of revitalizing a safety program and maintaining its effectiveness. Jack Daughty, a safety professional from Jackson, Mississippi, states that a safety program is only effective if it is presented in a meaningful manner. A safety document or written program is a tool that can be used to train employees and make them aware of potential workplace hazards. When employees give input and receive feedback from employers, a team approach evolves. As employees take part in the safety program, their expertise in the area of plant operations can make them experts in the areas of plant safety. Subsequently, the employee can communicate the need to work safely to fellow employees and create an ownership in a safety program that they believe in (Daugherty, 1994: Peterson 1999).

It is not the employees responsibility alone to become involved with and believing in a safety program, management must follow suit. Development and approval of a safety policy by senior management is the first step. The policy statement will show a commitment from management toward safety awareness. This can be used as a communication tool to relate the importance of safety to the employees and show that management is supporting the program (Daugherty, 1994).

The roles that managers are playing in the safety effort are changing and becoming more challenging (Killimett, 1996). They are requiring the integration of decisiveness with extreme caution. This is not new for this type of decision-making in the areas of quality and production. Managers routinely reconcile different approaches in order to achieve success in these two areas. In this regard, safety has the same requirements. Companies that are considered safety leaders

will settle for nothing less than this combination of decisive yet cautious managers. Their managers will also involve the entire organization in safety program management.

The pressures to downsize, rightsize, and cut costs are a way of doing business that is common to all industries. This means that companies must undertake challenges with fewer personnel. Success can be achieved only with total commitment and involvement from all levels of the organization. Furthermore, systems and procedures must be in place to ensure that tasks and responsibilities are being carried out. (Killimett, 1996).

Due to this way of conducting business, managers and employees must now share accountability and continuously keep asking questions such as; Are we going in the right direction? Is this working? How should we change? Companies who are making this method work for them have put the systems in place to evaluate their programs, reassign responsibilities, and support the change effort. This aggressive activity must involve all levels of the organization. Managers are becoming guides, rather than drivers of these activities, including the safety effort. The safety effort is now a system with total commitment from the whole organization. The role managers play in this effort is to install different levels of involvement and to send the right message to the organization. When there is total commitment, the whole organization will succeed (Killimett, 1996; Brown 1999).

Assessing Safety Programs

According to OSHA, 1993; Mathews, 1999, several things must take place for a formal safety program to be complete. Goals, procedures, and objectives must be established first. Upper management must commit to supporting the program and allocate the resources to do this. Once these goals have been in place, the next step is to perform an assessment on the program's effectiveness. This is how an organization will be able to tell how well the safety and health program is working.

When evaluating a safety program with an assessment tool, there are a number of issues that arise. Critical areas have been created to carry the safety programs, such as a written program, need to be examined. The assessment will determine whether the programs are working effectively and efficiently. All formal safety programs as well as any other type of related activity must be reviewed during this process. These would include management commitment and leadership, analysis of the worksite to identify hazards, hazard prevention and control, accident and near miss investigations, employee involvement, safety and health training, use of personal protective equipment, and the emergency response program. Any additional programs or activities that contribute to the safety program need to be included in this assessment as well (OSHA, 1993).

An assessment team needs to be established to conduct the review. This team may consist of managers, safety professionals, or individuals that are familiar with the operations of the organization. A very important issue when conducting the assessment is that it is made clear from the beginning that the assessment is focusing on the safety systems, rather than the people (OSHA, 1993).

During the assessment, three areas of focus will help drive the assessment. These are document review, employee interviews, and review of the site conditions. These essential areas will also help in the establishment of a structure for a final report of the assessment. The assessment tool should have structured areas for the placement of documentation. This includes a narrative of each program reviewed, corrective action of deficiencies, target start and or completion dates on corrective action, responsible individuals (OSHA, 1993).

Once the safety program has been implemented, continuous improvement is necessary for its success. Constant training and communication is the key for that success. The laws are changing everyday, as is the work force. The employees need to be abreast of all the changes that may

occur. Having a safety program in place is a way in which they can be informed. Employee communication and training are two of the most important items in a successful safety program (Daugherty, 1994).

Tyco Safety Audit

The self-assessment tool developed in this study was modeled after a similar assessment tool developed by Tyco International (1994). Tyco International is a worldwide organization that is active in many different business realms. Tyco is the primary holding company for Simplex Fiber Optic Cable, Kendall Disposable Medical Products, Allied Tube and Conduit, North American Printed Circuit Boards, and Mueller Company. Tyco International represents all facets of the manufacturing process. Tyco International facilities engage in many processes, including weaving, printing, spinning, machining, assembling, forging, melting, and pouring of iron (Tyco, 1996). Their facilities vary in structure from completely automated to very labor intensive and hazardous manufacturing plants.

The development of the Tyco Audit was a universal project of all the Tyco business units and risk management organizations. The contents of the audit were designed by a qualified group of safety professionals. The Sedgwick James Risk Management Division also played a major role in the establishment of the audit. Once the audit was developed, all of Tyco's safety managers reviewed, modified, and accepted the audit as the assessment tool for Tyco International (Towne, 1997).

Based on importance as established by safety directors, individual items in the Tyco Audit are assigned a possible point value ranging from 5 to 300. To achieve a passing rating, 85% of possible points must be obtained. Tyco utilized corporate safety auditors and outside consultants to administer the audit. The primary areas included in the Tyco Audit are Line Management

Involvement, Hazard Control and Inspections, General Safety Procedures, Safety Program Administration, Safety Committee Activity, Safety Training and Awareness, Housekeeping, Fire Prevention and Protection, Emergency Planning, Maintenance Department Functions, Accident Investigation and Statistics, Systems, and Safety Program Results.

The corporate business units of Tyco are diversified, which is why their audit was chosen as a model for the study. The Tyco Safety Audit is designed to fit across many different business units. The goal of the Tyco Audit is to measure the effectiveness of safety programs. The audit ensures that all systems are in place to ensure OSHA compliance. More importantly, the audit also serves to protect their greatest asset, their employees. Tyco's belief is that if all the programs are in place, then OSHA compliance, incident rates, and worker's compensation costs will be satisfactory (Towne, 1997).

Additional Safety Audits

An audit for small businesses from OSHA's Office for Cooperative Programs was found very similar to the Tyco International safety audit. The OSHA audit contained different sections where content was measured, such as management and employee involvement, work site analysis, programmatic areas of compliance, and employee safety and health training. The structure of the audit was in the form of an action plan, and the format had different columns of areas identified. These areas were essential indicators, yes/no compliance, comments, parties responsible for corrective action, and completion dates. The structure of this audit was very detailed.

In addition to the Tyco and OSHA audits, a ten-point safety evaluation from the Sedgewick James Risk Management Organization was reviewed (1992). This audit was detailed in format and covered a variety of areas of an organization's safety program. The audit was designed much like other safety audits, in order to give an organization a benchmark on where their safety program is

and to indicate where the focus needs to be in order to move forward with improving the program. The different evaluation categories included management support and direction, assignment of responsibility and authority, safety organizations, hiring orientation and training, hazard control, self inspections, accident investigation, first aid and medical, and compliance with regulations.

The structure of the Sedgwick audit is in the form of an outline with points that are awarded for compliance in different areas. The rating system is designed where zero indicates no system and three indicates a highly effective system. The points are totaled at the end of each section and at the conclusion of the audit, a final score is tabulated.

The fourth and final audit reviewed was from the Industrial Accident Prevention Association. This audit is described as a diagnostic tool designed to highlight the strengths and weaknesses of an organization's safety and health management system. This audit was designed and is consistent with the application of the international safety rating system, which is affiliated with the International Loss Control Institute (1988). The content of this audit is extremely detailed in structure and covered a number of areas of an organization's safety program such as top and front line management involvement, compliance with governmental regulations, safety committee activities, inspections, industrial hygiene, purchasing requirements, and contractor safety and compliance. The structure of the audit is in the form of a procedure outline with a point award system. Points are subtotaled at the end of each section and a final score is compiled at the summation of the audit. This audit was extremely thorough and detailed in content in regards to an organization's safety program.

The review of the various audits from different professional associations was very informative in the decision to use the Tyco International Audit as a model in this study. The Tyco International

Audit has similar areas of concentration to all of the audits reviewed. The decision to use the Tyco International Audit as a model was substantiated based on the review of other audits.

Summary

The review of the related literature indicates there are numerous benefits to developing and maintaining a formal compliance program and a tool to audit this program. Safety programs enable industries to comply with governmental laws, which is critical to plant operations. Programs of this type also improve employee safety and well being, which is essential to having a productive work force. A formalized compliance program helps to reduce worker's compensation costs. The increased communication and training, which is a product of a safety program's implementation, is necessary for continuous compliance. The literature demonstrates a positive trend toward compliance with safety and environmental laws.

The goal of this research is to have group consensus that the self-assessment tool is a useful mechanism for the printing industry. Having a tool to be able to assess an organization for its safety program strengths will help an organization become more effective in providing a safe and healthy work environment for their greatest assets, the employees.

CHAPTER III

Procedures of the Study

Introduction

The problem of the study was to develop a self-assessment tool for printing industry managers to audit their organizations for safety compliance. The self-assessment tool was modeled after an audit assessment tool developed by Tyco International. A panel of experts was selected and asked to confirm the tool's face validity as a self-assessment tool. This chapter discusses how the panel of experts was selected, the number of experts on the panel, and the method used to gain a consensus on the face validity of the assessment tool.

Expert Panel

The population served by this study consists of managers from the printing industry who perceive a need to audit their safety program's effectiveness and assess its compliance with OSHA standards. A professional from each of the following sectors was selected to serve on the panel of experts to represent this population: printing industry management, Occupational Health and Safety Administration, risk/management insurance industry, Printing Industry Association of Georgia, and a professional educator in the field of health and safety. The professionals were selected based on their experience, which indicated competence to adequately review an assessment tool such as the one developed in this study. The following are attributes used as a criterion for choosing the panel of experts:

1. A representative from the printing industry in the role of senior management was selected to review the audit tool from a practical point of view and determine if the auditing tool was applicable to printing operations. This representative was required to have a working knowledge of health and safety issues and the role it plays in the day to day operations of an organization.

2. A representative from the Occupational Health and Safety Administration (OSHA) was selected to assess the content of the audit for governmental compliance.

3. A professional from the risk/management insurance industry was selected to review the auditing tool from a proactive point of view, establishing that systems are in place to ensure safety compliance.

4. A representative from the professional organization of the Printing Industry Association of Georgia (PIAG) was selected to review the assessment tool for determining if the auditing tool would have broad application to the entire printing industry. The assessment tool was initially designed to cover a broad base of industry. This individual's expertise would help confirm this due to the experience and support a professional organization would have towards health and safety.

5. A professional educator in the area of health and safety was selected to review the tool from a practical point of view. A health and safety educator would determine whether the tool would be useful in the establishment of a sound health and safety program from an academic point of view.

Methods

A safety program self-assessment tool to be used specifically in the printing industry was developed by the author. The Tyco Audit was chosen as a model for the development of a printing industry self-assessment tool after a review of its content revealed the broad base of business segments that it represents. The self-assessment tool developed for the printing industry was designed to reflect the structure and discipline that the Tyco Audit represented. Several general areas of the Tyco Audit were not employed due to their specificity to the Tyco Industry. In addition to the audit developed by Tyco, other audits from other associations were reviewed. Table 1 includes a

sample page taken from the Tyco Audit. Five professionals were recruited and asked to review the self-assessment tool using a modified Delphi analysis technique. The information obtained from the panel of experts was then used to demonstrate the face validity of the tool.

Design

The Delphi Technique can be used to assess the face validity of self-assessment tools. This technique was used as a measurement tool because of the nature of its design, so as to achieve group consensus on the content and structure of the safety self-assessment tool in an expedient manner. The Delphi Technique was originally designed as a way to obtain the opinion of experts without bringing them all together. The group of experts make the decisions to accept, reject, and/or modify the integrity of the tool (Sutter, 1998).

The Delphi Technique was used in this study by a group of selected experts to evaluate the content of the safety self-assessment tool. This technique is a structured process where raters evaluate items as either acceptable or unacceptable. Group consensus must be obtained in order to retain the material. This approach of using summarized feedback is useful for generating and clarifying ideas, researching, reaching consensus, prioritizing and making decisions on alternative actions. (Butler and Howell, 1980).

Based on the Delphi Technique, a rating form was developed for use by the raters. The rating form consisted of items from the assessment tool followed by an area for comments pertaining to each specific area, as well as a final judgement of accept or reject.

Instrumentation

Tyco International's Safety Audit was chosen as a model for the current audit after a review of safety audits used in manufacturing and by other loss control insurers. A panel of experts developed the Tyco Audit, and its validity was obtained through group consensus.

As stated in Chapter II, Tyco International has a variety of manufacturing plants under their corporate umbrella. The use of the audit as a model would be suited for the printing industry due to the broad scope of processes and procedures involved in the Tyco industry. The Tyco Audit effectively evaluates the areas of importance in an effective safety evaluation of an organization. Certain areas of this audit were not used due to their lack of relevance to the printing industry. The scoring mechanism was also modified to be applicable to the current situation.

Data Collection

The panel of experts was contacted by telephone for a verbal commitment to participate in the study. Following the telephone contact, a letter (Appendix A), along with a copy of the assessment tool (Appendix B) and a rating form (Appendix C) were sent to the raters. A follow-up letter was developed and mailed three weeks after the initial letter to individuals who had not responded (see Appendix D). Based on the initial evaluation of the tool, revisions were made, and the final draft was sent to the raters for a final evaluation.

Data Analysis

Data analysis consisted of establishing group consensus on every item. After receiving all the raters response forms, the corrections to the self-assessment tool were made. Every one of the raters accepted the audit as an acceptable tool, but made suggested modifications. The suggested modifications were taken into consideration and applied to the modified self-assessment tool. The raters were then contacted by phone explaining that changes were made and that the self-assessment tool would be sent back for their final review. Once every item was rated acceptable by

every rater, the self-assessment tool was considered to have good content validity and to be complete.

Summary

In this chapter the procedures for reviewing the self-assessment tool were reviewed. The background on the panel of experts was also explained and the method for achieving group consensus regarding the validity of the self-assessment tool was described. In addition, the procedures to be used for data collection and data analysis were explained.

CHAPTER IV

Analysis of the Data

Introduction

The purpose of this study was to develop a self-assessment tool for printing industry managers to audit their safety program compliance with OSHA standards. The following sub problems were the focus of this study: (1) Identify and develop an auditing tool to assess safety programs. (2) Identify and utilize a measurement system to rate program effectiveness.

Survey Instrument Review Panel

A panel of experts was recruited to review the assessment tool, suggest any modifications, and provide approval of the final version. Group consensus was achieved by utilizing the Delphi Technique, which also served as an indication of face validity of the assessment tool. The data provided by the experts are reported in this chapter. Five professionals in the field of management, health, safety, and education were selected to serve as the panel of experts. The professionals were selected based on their experience, which is perceived as indicating competence to adequately review an assessment tool such as the one developed in this study.

The following data was obtained from the review of the self-assessment tool by the panel of experts. Along with the assessment tool, the panel of experts readers received a rating form that allowed them to accept or reject any section or items included in the assessment tool (See Appendix E for rating form). The results of their analysis were then analyzed for group consensus. For the purposes of this study, group consensus consisted of 100% agreement of the assessment instrument as a whole. Table 2 displays individual responses to each item.

Review Results

The first rater on the panel of experts was a professor of health and safety at a Community College. Rater 1 accepted the self-assessment as being a useful tool for the printing industry. Rater 1 offered some suggestions, including clarification on the awarding of points, clarification of overall scoring of the individual sections, and adjusting the weighting of certain sections. Rater 1 also recommended modifying the instructions for a portion of the audit and adding newer safety programs in the written program section.

The second rater on the panel of experts was the operations manager for a Lithographics firm. Rater 2 accepted the self-assessment as being a useful tool for the printing industry. Rater 2 stated that this was a valuable tool that the industry could benefit from and proffered no modifications.

The third rater on the panel of experts was from the Occupational Safety and Health Administration (OSHA) in Atlanta, Georgia. Rater 3 was very supportive of the assessment tool and its intended use. Rater 3 suggested that several sections of the assessment instrument be clarified to adhere to the code of federal regulations. He also recommended that the federal code be referenced more frequently. Rater 3 stated that as an agent of OSHA he could not approve the audit, due to an internal policy that OSHA cannot approve any type of program outside of the code of federal regulation. Rater 3 did, however, express satisfaction with the assessment tool.

The fourth rater on the panel of experts was from the risk/management insurance industry. Rater 4 also accepted the self-assessment tool as being a useful tool for the printing industry. Rater 4 offered some suggestions, including increasing the point value of certain sections and adding additional sections which would pertain to specific safety programs.

The fifth rater on the panel of experts was from the Printing Industry Association of Georgia. Rater 5 accepted the self-assessment tool as being a useful tool for the printing industry. Rater 5 provided some suggestions, which included increasing the scoring of certain sections, adding

additional safety programs that are specific to the printing industry but fall under the code of federal regulations, and clarifying certain sections in the audit.

The suggested alterations consisted of three types of adjustments: point adjustment, addition of specific safety programs, and clarification of content (see table 3). The modifications were applied to the assessment tool and a final revision was sent to the panel of experts. The panel of experts expressed satisfaction with the assessment tool.

Summary

The presentation and analysis of the data for this study are reported in this chapter. The purpose of this study was to develop a safety self-assessment tool for the printing industry to audit their safety program for OSHA compliance. The Delphi Technique was selected to assess the qualities of the self-assessment tool. The panel of experts confirmed that with few changes, the self-assessment tool is useful to the printing industry. It was thereby demonstrated that the self-assessment tool is a useful tool for the printing industry.

CHAPTER V

Conclusions, Recommendations, and Summary

Introduction

The problem of this study was to develop a self-assessment tool that would enable printing industry management to audit safety program compliance to OSHA standards. The following problems were associated with the purpose of this study: (1) Identify and develop an auditing tool to assess a safety program. (2) Identify and develop a measurement system to rate the program's effectiveness. A review of the literature identified the potential negative consequences of non-compliance with OSHA regulations. It was also shown that there is an absence of any type of tool to audit safety programs specific to the printing industry. Based on this information, the development of a safety self-assessment tool for the printing industry begun.

The safety self-assessment tool was developed after reviewing a number of existing safety audits. The audits reviewed for this study are currently in use by the insurance industry, OSHA, and other major manufacturing organizations (see chapter 2 p.28). The structure of the safety self-assessment tool was primarily modeled after the safety audit that Tyco International currently uses in its business segments. Because of the broad range of manufacturing processes under Tyco's corporate umbrella, the self-assessment tool was identified as an ideal model for the development of the current audit.

Conclusions

The revised safety self-assessment tool was finalized after an extensive review of existing safety audits indicated that there was no tool specific to the printing industry at the time of the study. Five professionals from the printing industry, Occupational Health and Safety Administration, risk/ management insurance industry, Printing Industry Association of Georgia, and a professional educator in the field of health and safety were selected to serve as the panel of experts to review the self-assessment tool for this population. The professionals were selected based on their experience, which is perceived as indicating competence to adequately review an assessment tool such as the one developed in the present study.

The experts, who then completed a rating form, reviewed the self-assessment tool. The panel of experts had the opportunity to accept or reject the assessment tool. Four of five experts accepted the assessment tool as being useful. The dissenter was the OSHA representative. OSHA employees are restricted from approving anything outside of the code of federal regulations. The OSHA employee was, however, very supportive of the assessment tool and the effort being made to assist the printing industry in developing a process to improve safety.

All suggested modifications were made and returned to the panel of experts for final review and approval. Outside of the OSHA employee, group consensus was achieved by using the Delphi Technique. The use of the Delphi Technique allows group consensus to be achieved in a very expedient manner, which allowed a rapid closure on the acceptance of the self-assessment tool.

Recommendations for Further Study

The primary recommendation for further study would be to apply the safety self-assessment audit to printing industry companies processes, such as lithography, flexography, or gravure. This would demonstrate the applied effectiveness of the tool as well as establish a benchmark on how the printing industry measures up to OSHA compliance.

An additional recommendation for future study would be to develop and append further sections that pertain to specific safety programs that are implemented by OSHA. The third recommendation for further study would be to establish inter-rater reliability of individual items by distributing the tool to various raters and asking them to assign a point value to each item.

Summary

The purpose of this study was to develop a safety self-assessment tool for the printing industry to audit OSHA compliance. The study was established after a representative from the printing industry stated his concern that the industry did not currently have an effective way of auditing themselves for OSHA compliance. In a time where governmental regulations are playing a major role in the printing industry, there is a strong need to stay current.

A review of the related literature on the regulations and related case studies reinforced the need for the development of the assessment tool. The unanimous response to the self-assessment from the panel of experts supported the validity of the self-assessment tool. The panel of experts accepted the self-assessment tool as being useful for the printing industry. Minor modifications were suggested and then made. The modified self-assessment tool was then returned to the panel of experts for their final review and an eventual unanimous agreement. The Delphi Technique was used to achieve group consensus and this was proven to be successful after the minor modifications were made to the self-assessment tool.

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APPENDICES

APPENDIX A
Correspondence

APPENDIX A
Correspondence

Date

Dear :

Thank you in advance for your participation in this Delphi study. As previously mentioned, this study is being conducted in compliance with my Georgia Southern University Master of Technology thesis, which is the development of a safety self-assessment tool for the printing industry. This safety self-assessment tool will be used to audit safety program effectiveness. Your response will help establish face validity for the self-assessment tool.

Attached please find the self-assessment tool along with a rating form. Please review the assessment tool and make any changes or suggestions to the content. However, you may accept it as is.

Please complete and mail by October 11th using the return, self-addressed envelope enclosed. The results will be reviewed, analyzed, and returned to you for review. This second round is necessary to establish consensus among the Delphi committee. Any further changes you wish to make to your previous response may be done so at that time.

Thank you again for you participation and your time. Your input will allow me to better validate the contents of the safety self-assessment tool and be a service to the printing industry. If you have any questions, please contact me at (515) 673-8611 or at jgrahek@clowvalve.com

Sincerely,

John L. Grahek

APPENDIX B
Original Safety Self-assessment Tool

Safety Program
Self-Assessment Tool

ORGANIZATION
DATE
SAFETY REPRESENTATIVE

Scoring: Full score for complete written program and full implementation. Half score for written program and partial implementation. 85% score for those programs that are written, implemented and have rare to occasional deficiencies. No score for no written program and/or no implementation.

MANAGEMENT INVOLVEMENT

Criteria	Rating	Comments
1. Have safety goals and objectives been established for the plant and each department by plant manager?	10	
1a. Has management conveyed safety goals to all employees and are they aware of goals?	20	
1b. Are the goals and objectives reviewed regularly by management and is there evidence of corrective action if goals were not met?	20	
2. Has top management designated authority and responsibility for safety in writing for all management levels and hourly employees?	20	
3. Has management developed written procedures or guidelines for safety (e.g., safety manual) that are program and task specific?	20	
3a. Is there any evidence of implementation records, reports, statistical improvements?	10	
4. Do they include responsibilities for specific personnel? (e.g., Maintenance will perform hoist checks, Security will perform fire exiting checks.)	5	
5. Are safety deficiencies designated the responsibility of line management?	20	

Additional Comments:

MANAGEMENT INVOLVEMENT

Criteria	Rating	Comments
6. Do all levels of management participate in safety activities such as (a) Safety Committee meetings? (b) Plant Inspections? (c) Written safety directives? (d) Evaluations? (e) Follow-up on recommendations from both in-house or outside consultants? (f) review of internal safety programs?	20	
7. Does management hold accountable those having safety responsibilities? (e.g.: Do managerial and supervisor performance reviews include safety performance elements and is goal attainment rewarded?	20	
8. Has management developed a system to assure that resources are available when needed to fix safety deficiencies? Is it part of the dept. budget process? Is there a suggestion program or another system for employees to identify opportunities for improvement?	150	
8a. Is there evidence of its overall success?	50	
9. Is the supervisors' area of authority clearly defined to assure effective safety management, (making out workorders, shutting down unsafe machinery, and allocating personnel to repair items)?	30	

Additional Comments:

MANAGEMENT INVOLVEMENT

Criteria	Rating	Comments
10. Have safety recommendations from previous inspections been completed or significant progress made? Purchase orders made out, written plans, quotes given, etc.	50	
11. Have all the supervisory staff participated in Safety Training Courses during the past year?	20	
12. Is there a review program or follow-up to initial supervisory safety training?	20	
13. Does supervisory staff conduct safety training according to program documents and is training documented?	15	
14. Are supervisory staffs familiar with the accidents experienced in their respective departments?	15	
14a Are employees notified of deficiencies and safety hazards?	15	

Additional Comments:

MANAGEMENT INVOLVEMENT

Criteria	Rating	Comments
15. Do supervisory staff or designated employees perform monthly inspections of their own or other departments.	50	
16. (a) Do supervisors or designated employees use a written guideline for conducting inspections on a scheduled basis?	25	
(b) Are they able to show the results of inspections submitted to manager and that they were followed up? Are they on a master deficiency list?	25	
16. Do supervisors follow-up on work order corrective actions resulting from accident investigations? Does evidence exist of the follow-up and remediation of these hazards?	20	
17. Employee involvement. Are there vehicles for employee involvement besides monthly safety committee meetings? Examples would include writing a Job Safety Analysis, doing inspections, training, writing procedures, working with engineering on safety issue solutions.	100	

TOTAL POSSIBLE = 750
SCORE: _____ _____%

Additional Comments:

HAZARD CONTROL AND INSPECTIONS

Criteria	Rating	Comments
1. Are Area Safety Tours made to identify unsafe acts and conditions?	15	
2. Are the recommendations resulting from each Safety Tour distributed to supervisors and followed up by management?	20	
3. Are target completion dates assigned to recommendations, which can not be completed immediately?	10	
4. Are all employees who conduct Safety Tours provided with Inspection guidelines outlining conditions or procedures to be checked?	15	
5. Does a review of Safety Tour reports indicate that inspections are thorough and relate to hazards and potential accident causes?	20	
6. Does the equipment inspection program meet the current OSHA requirements and is it adequate for the type of operations and hazards found in this facility? (e.g., Electrical safety, hoist inspection, forktruck, pressurized tanks, welding safety.)	50	
7. Does all machine guarding meet OSHA and ANSI standards?	100	

TOTAL POSSIBLE = 230
SCORE: _____ _____%

Additional Comments:

GENERAL SAFETY PROCEDURES

Criteria	Rating	Comments
General Safety Rules		
1. Are general safety rules applicable to all employees published? e.g., safety shoes, eyeglasses, hard hats. Is there a procedure to confirm that all employees know and understand safety rules?	10	
2. Are such rules followed? Example: Are employees handling corrosives actually wearing face, eyes, hands and body protection?	10	
3. Are such rules revised and reissued as necessary? Can they show evidence of revisions?	5	
4. Are definite enforcement procedures established and followed? Is there written evidence showing enforcement procedures have been carried out? (disciplinary notices)	15	
Departmental and Job Safety Rules		
5. Have department (job) safety rules been outlined and placed in use? Are the rules complete? Is there evidence that they are followed?	45	
6. Are chemical inventories in labs and other 'specialty areas' reviewed regularly? Outdated material removed?	10	

TOTAL POSSIBLE = 135
SCORE: _____ _____%

Additional Comments

SAFETY TRAINING AND AWARENESS

Criteria	Rating	Comments
1. Is there a safety orientation program for all new employees?	20	
2. Is there a new job training program and does it include a written guideline or checklist with supervisors? This applies to new hires and transfers from other departments.	20	
3. Is there a documented follow-up program for initial safety training of hourly employees?	25	
4. Do operator training programs include all new employee or acutely hazardous tasks? If the workforce is multilingual, are the programs also written in the appropriate languages? Are they written in a clear concise manner on the appropriate education level?	15	
5. Does the workplace and work activities provide evidence that employees have been well trained in Safety Directives?	20	
6. Are training programs geared towards eliminating current accident problems or hazards?	15	
7. Are statistics kept to show the effectiveness or areas of needed improvement for training to new employees?	20	

TOTAL POSSIBLE = 135
SCORE: _____ _____%

Additional Comments:

HOUSEKEEPING

Criteria	Rating	Comments
1. Has management identified housekeeping as an element of line mgt. responsibility?	25	
2. Are aisles cleared for passage and appropriately marked?	25	
3. Are walking and working surfaces in good physical repair and kept clean and dry?	25	
4. Where wet processes are used, is drainage maintained, and are false floors, platforms, or mats provided for dry standing placed where practical?	15	
5. Are there adequate trash receptacles for trash/litter, are they well maintained, free of chemicals, appropriately situated?	25	
6. Are tools properly stored and not kept haphazardly in work areas?	5	

Additional Comments:

HOUSEKEEPING

Criteria	Rating	Comments
7. Are storage areas in order and is material stored properly?	25	
8. Are stairways accessible with no storage on steps or treads?	25	
9. Are the stairways provided with adequate lighting? (75 foot/candles)	5	
10. Are pallets in use in good working condition?	35	
11. Is the storage of in-line materials in production areas kept at a minimum?	35	
12. Is equipment kept clean and free of debris, etc.?	20	

TOTAL POSSIBLE = 265
SCORE: _____ _____%

Additional Comments:

SAFETY COMMITTEE ACTIVITY

Criteria	Rating	Comments
1. Is there access to a safety committee or to a representative of a committee for all employees?	20	
2. Is there an Executive safety steering committee with the Executive staff, Safety director, and other key personnel as members. Do they meet at least monthly? Is there a standing agenda that includes accident statistics, recent pertinent accidents, current projects, and positive and negative aspects of the safety program.	20	
3. Are meeting minutes of all committees kept with a copy delivered to the Safety Office and do they reflect issues discussed and actions taken? Are they results oriented?	15	
4. Are Safety Tour reports reviewed and acted upon by the department level committee?	10	
(a) Are recommendations formalized as needed with requests to Eng., purchasing etc.?	5	
5. Are representative supervisory staff included on the safety committees?	10	

TOTAL POSSIBLE = 80
SCORE: _____ _____%

Additional Comments:

FIRE PREVENTION AND PROTECTION

Criteria	Rating	Comments
1. Does a drawing exist showing area layouts, hazards, exits, is it up to date and is it posted?	25	
2. Are flammable liquids stored, handled or transported in a safe manner (e.g., grounded, labeled and kept in approved UL or FM containers)?	20	
3. Are storage tanks installed in compliance with NFPA 30 or FM guides?	15	
4. Are fixed and portable fire extinguishers inspected and maintained as outlined by N.F.P.A. standards (annually by outside vendors and more frequent internally)?	15	
5. Is there a program for the care and maintenance of sprinkler systems and are records maintained of design, performance and maintenance checks?	20	
6. Are employees trained in emergency response procedures?	20	
7. Are fire alarm and fire door systems inspected and maintained?	20	
8. Has the local fire department had the offer to tour the facility within the past year? Have recommendations from outside services such as insurance carriers and local fire departments been implemented?	20	

TOTAL POSSIBLE = 155
SCORE: _____ _____%

Additional Comments

EMERGENCY PLANNING

Criteria	Rating	Comments
1. Does management maintain a disaster plan, and is it adequate for the type of emergencies that could occur at this facility?	20	
2. Does this facility comply with the local safety planning for disaster planning, and is correspondence available to show cooperation with local agencies?	20	
3. Are the people who are assigned duties in the disaster or emergency plan trained in their assignments?	20	
4. Are there at least annual plant and office evacuation drills?	15	
5. Are the potential emergency coordinators for this facility familiar with the emergency communication procedure?	20	
6. Have the environmental spill control procedures been developed and implemented?	20	
7. Is there an emergency response committee at this facility?	10	

Additional Comments:

EMERGENCY PLANNING

Criteria	Rating	Comments
8. Can the in plant emergency alarm be heard in all areas? Is the meaning clear to all employees? How often are they tested? Are contractors, vendors and unescorted visitors apprised of emergency procedures and alarms?	20	
9. Is there a medical support system available that can be consulted for multiple-injury accidents?	10	
10. Are Material Safety Data Sheets (MSDS) available on premises, the fire department and local Emergency room.	20	
11. Have local fire and police officials been kept apprised of the operations and the materials handled at your location? (e.g., new chemicals, lines, processes?)	10	
12. Is there an adequate written inspection program to insure the operable condition of all emergency equipment such as alarm, exit lights, fire protection and prevention equipment, communication systems, etc.?	15	

TOTAL POSSIBLE = 210
SCORE: _____ _____%
Additional Comments:

MAINTENANCE DEPARTMENT FUNCTIONS

Criteria	Rating	Comments
1. Is there a written scheduled preventive maintenance program?	20	
2. Does it include checking and testing of safety guards such as safety interlocks, and valves, removable machine guards, ventilation, grounding controls and alarms, welders, condition of electrical distribution centers, etc.	20	
3. Does a review of the program requirements and the records verify compliance with the program?	15	
4. Do maintenance personnel participate in safety committee and other safety functions?	10	
5. Is priority given to safety related maintenance items? Are they corrected within 24 hours or a plan made for correction?	20	
6. Does the Maintenance dept. apply OSHA/ANSI standards for the construction and application of machine guards?	15	

MAINTENANCE DEPARTMENT FUNCTIONS

Criteria	Rating	Comments
7. Are cranes and other hoisting equipment inspected annually by outside qualified personnel with results properly documented?	10	
8. Are supervisors and employees satisfied with the maintenance of their machines? Would these concerns affect safety?	5	
9. Do safety rules for maintenance personnel include:	20	
(a) Use of personal protective equipment?		
(b) Working on confined spaces?		
(c) Welding and cutting permits?		
(d) Lockout procedures?		
10. Do the Maintenance department employees have a good knowledge of accepted safety practices and legal requirements? (Machine guarding, hoist program, hot work permits, etc.)	10	

TOTAL POSSIBLE = 145
SCORE: _____ _____%

ACCIDENT INVESTIGATION AND STATISTICS

Criteria	Rating	Comments
1. Are accidents reported promptly? (within 24 hours to the safety office)	10	
2. Are written investigations determining cause and possible corrective measures completed on:	100	
(a) First-aid injuries? (b) OSHA recordable and Lost time injuries? (c) Accidents not involving injury (near miss)? (d) Unsafe acts of a repetitive nature?		
3. Are investigation reports reviewed by department managers and signed?	20	
4. Are suggested corrective measures followed up? Is there a paper trail to follow for major items?	20	

ACCIDENT INVESTIGATION AND STATISTICS

Criteria	Rating	Comments
5. In the accident investigation, is consideration given to possible deficiencies in the following: Are they complete/thorough?	80	
(a) Management policy? (b) Effectiveness of Supervisors? (c) Training of Supervisors? (d) Employee selection and training? (e) Design of equipment layout, work procedures? (f) Selection of material and processes?		
6. Are accident repeaters being counseled and/or disciplined for unsafe acts as necessary?	10	
7. Are plant-wide accident frequency and severity statistics maintained and updated as needed?	20	
8. Are accident statistics maintained on a departmental basis in order to establish trends, identify problem areas, etc.?	20	

Additional Comments:

ACCIDENT INVESTIGATION AND STATISTICS

Criteria	Rating	Comments
9. Are all employees kept aware of the accident experience compiled by the plant and their departments?	15	
10. Are the OSHA 200 logs consistent with published guidelines from the Department of Labor?	250	
11. Does supervisory staff investigate accidents and near miss incidents which occur to employees directly under their supervision and are these investigations reviewed by department managers? Does the documentation of these reviews exist?	20	
12. Is property damage that does not entail injury investigated and actions taken?	20	

TOTAL POSSIBLE = 545
SCORE: _____ _____%

Additional Comments:

WRITTEN SAFETY PROGRAMS

Criteria	Rating	Comments
1. Are program documents that exist ISO compliant or use a systems approach? a. Controlled documents? b. Signed off by affected department managers	20	
2. Is there a document depicting the program, training for that program, and inspections for that program?	250	
a. Confined space program b. Lockout tagout program (machine specific) c. Electrical safety d. Fire safety and evacuation e. Hazard Communication f. Hoist safety g. Forklift program h. JSA's for each area or similar vehicle for explaining how to safely perform a task i. Welding safety j. Radiation protection program k. Lab safety program (lab only) l. Hazardous waste removal systems. m. How to report a hazard n. Personal protective equipment that includes a 'certified' survey of hazards? o. Industrial Hygiene with levels measured against OSHA PEL and/or ACGIH TLV's? p. Ergonomics q. Contractor safety		

Additional Comments:

WRITTEN SAFETY PROGRAMS

Criteria	Rating	Comments
3. Are employees knowledgeable about the following programs? As determined by questions or results of inspections conducted in the facility-see question 2 (inspections).	250	

a. Confined Space
b. Lockout/Tagout
c. Electrical Safety
d. Fire Safety/Evacuation
e. Hazard Communication
f. Hoist Safety
g. Forktruck Program
h JSA's for their area
i. Welding Safety (Hot Work)
j. Radiation
k. How to Report a Hazard
l. Lab Safety (Lab employees only)
m. Hazardous Waste Removal procedures
n. PPE
o. Orientation (New Employees only who have worked <1 year)
p. Levels of noise, radiation, or chemicals from the most recent studies.

Additional Comments:

WRITTEN SAFETY PROGRAMS

Criteria	Rating	Comments
SAFETY ISSUE MANAGEMENT:		
4. Are safety issues determined by the following sources (provide supporting evidence)? a. Employee Concern? b. Safety Manager Observation? c. Supervisor Observation? d. Manager Observation? e. Accident with Injury Reports? f. Near Miss Reporting?	100	
5. Do these issues show evidence of being tracked and managed to resolution? a. Closure dates established? b. Person responsible for resolution assigned and aware of assignment? c. Past file of completed issues? d. Money or resources allocated?	50	
6. Are the hourly employees involved in the resolution of more than 50% of the safety issues?	50	
7. Is accountability for using the safety systems reflected in the manager and supervisory performance evaluations?	100	

TOTAL POSSIBLE = 820
SCORE: = _____ _____%

Additional Comments:

SAFETY PROGRAM RESULTS

Criteria	Rating	Comments
1. Has the lost time case incident rate decreased by 25% over last year.	150	
2. Have the number of lost workdays per 1000 hours worked, decreased in comparison to last year?	100	
3. Are the current costs less than or equal to the previous years costs?	300	
4. Has the overall case count on OSHA recordables fallen or is below your established goal from the previous year?	300	

TOTAL POSSIBLE = 850
SCORE: = _____ _____%

Additional Comments:

Safety Program
Self Assessment
Credits

CRITERIA	ATTAINED	POSSIBLE
Line Management Involvement		750 pts.
Hazard Control and Inspections		265 pts.
General Safety Procedures		135 pts.
Safety Training and Awareness		135 pts.
Housekeeping		265 pts.
Fire Prevention and Protection		155 pts.
Emergency Planning		210 pts.
Maintenance Department Functions		145 pts.
Accident Investigation and Statistics		545 pts.
Written Safety Programs		820 pts.
Safety Program Results		850 pts.
	TOTAL	4,225 pts.

General comments:

APPENDIX C
Rating Form

Safety Self-assessment Tool Validation Form
Date

Name of Participant

_____ I agree that the attached safety self-assessment tool is a useful tool for the printing industry to use to assess their safety program.

_____ I disagree that the attached safety self-assessment tool is a useful tool for the printing industry to use to assess their safety program based on the following reasons:

Section
Line Management Involvement

Item #	**Rater**	**Accept**	**Reject**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			

Section
Hazard Control and Inspections

Item #	**Accept**	**Reject**
1		
2		
3		
4		
5		
6		
7		

Section
General Safety Procedures

Item #	**Accept**	**Reject**
1		
2		
3		
4		
5		
6		

Section
Safety Training and Awareness

Item #	**Accept**	**Reject**
1		
2		
3		
4		
5		
6		
7		

Section
Housekeeping

Item #	**Accept**	**Reject**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Section
Safety Committee Activity

Item #	**Accept**	**Reject**
1		
2		
3		
4		
5		

Section
Fire Prevention and Inspection

Item #	**Accept**	**Reject**
1		
2		
3		
4		
5		
6		
7		
8		

Section
Emergency Planning

Item #	**Accept**	**Reject**
1		
2		
3		
4		
5		
6		
7		

Section
Maintenance Department Functions

Item #	**Accept**	**Reject**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Section
Accident Investigation and Statistics

Item #	**Accept**	**Reject**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Section
Written Safety Programs

Item #	**Accept**	**Reject**
1		
2		
3		
4		
5		
6		
7		

Section
Safety Program Results

Item #	Accept	Reject
1		
2		
3		
4		

APPENDIX D
Correspondence

APPENDIX D
Correspondence

Date

Dear, :

This is a letter to remind you of your participation in the validation of a self-assessment tool for the printing industry. Your expediency in this matter is greatly appreciated. Please return it to me by sending it back in the envelope attached. Please be assured that your comments and concerns will be confidential.

If you have any questions about the study, you may contact me at (515) 673-8611 EXT. 274 or (515) 673-8854. If you have any questions or concerns about your rights as a research participant in this study, you may contact Neil Garretson Chair of the Institutional Review Board, (912) 681-5465.

I want to thank you for your assistance in this study. Your input will allow me to better validate the contents of the safety self-assessment tool.

Sincerely Yours,

John L. Grahek

APPENDIX E
List of Panel of Experts

APPENDIX E
List of Panel of Experts

Professional Educator in Health and Safety
Dr. Dennis Zeimet – Professional Educator
2006 S. Ankeny Blvd.
Des Moines Area Community College
Ankeny, IA 50021
(515) 964-6697

Printing Industry Representative
Mr. Randy Lewis – Plant Manager
Lewis Color Lithographics
30 Joe Kennedy Blvd.
Statesboro, GA 30458
(912) 681-6824

OSHA Representative
Mr. Michael Shea – Safety Specialist
United States Department of Labor – OSHA
61 Forsyth St. SW
Sam Nunn Federal Center R6T50
Atlanta, GA 30303
(404) 562-2284

Risk Management/Insurance Industry
Mr. Charley Harris – Consultant
Sedgwick James of the Carolinas
2000 Center Point Drive, Suite 2350
Columbia, SC 29221
(803) 772-1111

Printing Industry Association of Georgia (PIAG)
Mr. Tim O'Donald
Printing Industry Association of Georgia
5020 Highland Parkway
Smyrna, GA 30082
(770) 433-3050

APPENDIX F
Modified Safety Self-Assessment Tool

Safety Program
Self Assessment Tool

ORGANIZATION

DATE

SAFETY REPRESENTATIVE

Scoring: Participants will receive a full score for having completely written safety program and it is in full implementation. Half scores will be awarded for having a written program, but only partial implementation (an example of this would be having a written lock out tag out program, but no locks being issued or employees aren't aware of the program content). 85% score for those programs that are written, implemented and have rare to occasional deficiencies (deficiencies will be identified when interviewing employee and conducting plant tours). No score for no written program and/or no implementation.

MANAGEMENT INVOLVEMENT

Criteria	Rating	Comments
1. Have safety goals and objectives been established for the plant and each department by plant manager?	10	
1a. Has management conveyed safety goals to all employees and are they aware of goals?	20	
1b. Are the goals and objectives reviewed regularly by management and is there evidence of corrective action if goals were not met?	20	
2. Has top management designated authority and responsibility for safety in writing for all management levels and hourly employees?	20	
3. Has management developed written procedures or guidelines for safety (e.g., safety manual) that are program and task specific?	20	
3a. Is there any evidence of implementation records, reports, statistical improvements?	10	
4. Do they include responsibilities for specific personnel? (e.g., Maintenance will perform hojst checks, Security will perform fire exiting checks.)	5	
5. Are safety deficiencies designated the responsibility of the front line supervisor?	20	

Additional Comments:

MANAGEMENT INVOLVEMENT

Criteria	Rating	Comments
6. Do all levels of management participate in safety activities such as (a) Safety Committee meetings? (b) Plant Inspections? (c) Written safety directives? (d) Evaluations? (e) Follow-up on recommendations from both in-house or outside consultants? (f) review of internal safety programs?	50	
7. Does management hold accountable those having safety responsibilities? (e.g.: Do managerial and supervisor performance reviews include safety performance elements and is goal attainment rewarded?	20	
8. Has management developed a system to assure that resources are available when needed to fix safety deficiencies? Is it part of the dept. budget process?	100	
8a. Is there a suggestion program or another system for employees to identify opportunities for improvement?Is there evidence of its overall success?	100	
9. Is the supervisors' area of authority clearly defined to assure effective safety management, (making out workorders, shutting down unsafe machinery, and allocating personnel to repair items)?	50	

Additional Comments:

MANAGEMENT INVOLVEMENT

Criteria	Rating	Comments
10. Have safety recommendations from previous inspections been completed or significant progress made? Purchase orders made out, written plans, quotes given, etc.	50	
11. Have all the supervisory staff participated in Safety Training Courses during the past year?	50	
12. Is there a review program or follow-up to initial supervisory safety training?	20	
13. Does supervisory staff conduct safety training according to program documents and is training documented?	15	
14. Are supervisory staffs familiar with the accident experienced in their respective departments?	30	
14a Are employees notified of deficiencies and safety hazards?	15	

Additional Comments:

MANAGEMENT INVOLVEMENT

Criteria	Rating	Comments
15. Do supervisory staff or designated employees perform monthly inspections of their own or other departments.		
(a) Do supervisors or designated employees use a written guideline for conducting inspections on a scheduled basis?	25	
(b) Are they able to show the results of inspections submitted to manager and that they were followed up? Are they on a master deficiency list?	25	
16. Do supervisors follow-up on work order corrective actions resulting from accident investigations? Does evidence exist of the follow-up and remediation of these hazards?	20	
17. Employee involvement. Are there vehicles for employee involvement besides monthly safety committee meetings? Examples would include writing a Job Safety Analysis, doing inspections, training, writing procedures, working with engineering on safety issue solutions.	100	

TOTAL POSSIBLE = 795
SCORE: _____ _____%

Additional Comments:

HAZARD CONTROL AND INSPECTIONS

Criteria	Rating	Comments
1. Are area Safety audits made to identify unsafe acts and conditions?	15	
2. Are the recommendations resulting from each Safety Tour distributed to supervisors and followed up by management?	20	
3. Are target completion dates assigned to recommendations, which cannot be completed immediately?	10	
4. Are all employees who conduct Safety Tours provided with Inspection guidelines outlining conditions or procedures to be checked?	15	
5. Does a review of Safety Tour reports indicate that inspections are thorough and relate to hazards and potential accident causes?	20	
6. Does the equipment inspection program meet the current OSHA requirements and is it adequate for the type of operations and hazards found in this facility? (e.g., Electrical safety, hoist inspection, forktruck, pressurized tanks, welding safety.)	50	
7. Does all machine guarding meet OSHA and ANSI standards and do they exeed these standards to assure protection?	300	

TOTAL POSSIBLE = 430
SCORE: _____ _____%

Additional Comments:

GENERAL SAFETY PROCEDURES

Criteria	Rating	Comments
General Safety Rules		
1. Are general safety rules applicable to all employees published? e.g., safety shoes, eyeglasses, hard hats, gloves, loose clothing. Is there a procedure to confirm that all employees know and understand safety rules?	10	
2. Are such rules followed? Example: Are employees handling corrosives actually wearing face, eyes, hands and body protection?	10	
3. Are such rules revised and reissued as necessary? Can they show evidence of revisions?	5	
4. Are definite enforcement procedures established and followed? Is there written evidence showing enforcement procedures have been carried out? (disciplinary notices)	15	
Departmental and Job Safety Rules		
5. Have department (job) safety rules been outlined and placed in use? Are the rules complete? Is there evidence that they are followed?	45	
6. Are chemical inventories in labs and other 'specialty areas' reviewed regularly? Outdated material removed?	10	
TOTAL POSSIBLE = 95		
SCORE: _____ _____%		

Additional Comments:

SAFETY TRAINING AND AWARENESS

Criteria	Rating	Comments
1. Is there a safety orientation program for all new employees?	20	
2. Is there a new job training program and does it include a written guideline or checklist with supervisors? This applies to new hires and transfers from other departments.	20	
3. Is there a documented follow-up program for initial safety training of hourly employees?	25	
4. Do machine operator training programs include all new employees and are they task specific? If the workforce is multilingual, are the programs also written in the appropriate languages? Are they written in a clear concise manner on the appropriate education level?	15	
5. Do the workplace activities show evidence that employees have been well trained in Safety Directives?	20	
6. Are training programs geared towards eliminating or controlling current accident problems or hazards?	15	
7. Are safety statistics evaluated to identify areas of needed improvement for training to new employees?	20	
8. Is there a training matrix available to track safety training throughout the year and on an annual basis?	75	

TOTAL POSSIBLE = 210
SCORE: _____ _____%

Additional Comments:

HOUSEKEEPING

Criteria	Rating	Comments
1. Has management identified housekeeping as an element of the first line supervisors responsibility?	25	
2. Are aisles cleared for passage and appropriately marked?	25	
3. Are walking and working surfaces in good physical repair and kept clean and dry?	25	
4. Where wet processes are used, is drainage maintained, and are false floors, platforms, or mats provided for dry standing placed where practical?	15	
5. Are there adequate trash receptacles for trash/litter, are they well maintained, free of chemicals, appropriately situated? Are there flammable storage containers for rags and solvents?	25	
6. Are tools properly stored and not kept haphazardly in work areas?	5	

Additional Comments:

HOUSEKEEPING

Criteria	Rating	Comments
7. Are storage areas in order and is material stored properly? Are storage racks properly labled for load limits.	25	
8. Are stairways accessible with no storage on steps or treads and are steps or treads worn or slick?	25	
9. Are the stairways provided with adequate lighting? (75 foot/candles)	10	
10. Are pallets in use in good working condition?	25	
11. Is the storage of in-use materials in production areas kept at a minimum, such as solvents and cleaners?	35	
12. Is equipment kept clean and free of debris, etc.?	20	
13. Is there a spill response procedure for cleaning chemical spills?	35	

TOTAL POSSIBLE = 295
SCORE: _____ _____%

Additional Comments:

SAFETY COMMITTEE ACTIVITY

Criteria	Rating	Comments
1. Is there access to a safety committee or to a representative of a committee for all employees?	20	
2. Is there an Executive safety steering committee with the Executive staff, Safety director, and other key personnel as members. Do they meet at least monthly? Is there a standing agenda that includes accident statistics, recent pertinent accidents, current projects, and positive and negative aspects of the safety program.	20	
3. Are meeting minutes of all committees kept with a copy delivered to the Safety Office and do they reflect issues discussed and actions taken? Are they results oriented?	15	
4. Are Safety Audits reviewed and acted upon by the department level committee?	20	
(a) Are recommendations formalized as needed with requests to Engineering for purchasing machines, guards, light curtains,etc.?	5	
5. Are representative supervisory staff included on the safety committees from all departments?	10	

TOTAL POSSIBLE = 90
SCORE: _____ _____%

Additional Comments:

FIRE PREVENTION AND PROTECTION

Criteria	Rating	Comments
1. Does a current evacuation plan exist showing area layouts, hazards, exits, and is it posted?	25	
2. Are flammable liquids stored, handled or transported in a safe manner and is in compliance with OSHA 1910.106 standard (e.g., grounded, labeled and kept in approved UL or FM containers)?	100	
3. Are storage tanks installed in compliance with NFPA 30 or FM guides such as sprinkler protection and spill dikes and is in compliance with OSHA standard 1910.106?	15	
4. Are fixed and portable fire extinguishers inspected and maintained as outlined by N.F.P.A. standards and is in compliance with OSHA standard 1910.160 (annually by outside vendors and more frequent internally)?	20	
5. Is there a program for the care and maintenance of sprinkler systems and are records maintained of design, performance and maintenance checks?	20	
6. Are employees trained in emergency response procedures and fire extingusher use?	20	
7. Are fire alarm and fire door systems inspected, unlocked, and maintained?	20	
8. Has the local fire department had the offer to tour the facility within the past year? Have recommendations from outside services such as insurance carriers and local fire departments been implemented?	20	

TOTAL POSSIBLE = 240
SCORE: _____ _____%

Additional Comments:

EMERGENCY PLANNING

Criteria	Rating	Comments
1. Does management maintain a disaster plan, and is it adequate for the type of emergencies that could occur at this facility?	20	
2. Does this facility comply with the local safety planning for disaster planning, and is correspondence available to show cooperation with local agencies?	20	
3. Are the people who are assigned duties in the disaster or emergency plan trained in their assignments and at certain levels, awareness, operator, etc?	20	
4. Are there at least annual plant and office evacuation drills?	15	
5. Are the potential emergency coordinators for this facility familiar with the emergency communication procedure?	20	
6. Have the environmental spill control procedures been developed and implemented and are spill kits available?	20	
7. Is there an emergency response committee at this facility?	10	

Additional Comments:

EMERGENCY PLANNING

Criteria	Rating	Comments
8. Can the in plant emergency alarm be heard in all areas? Is the meaning clear to all employees? How often are they tested, annually? Are contractors, vendors and unescorted visitors apprised of emergency procedures and alarms?	20	
9. Is there a medical support system available that can be consulted for multiple-injury accidents?	10	
10. Are Material Safety Data Sheets (MSDS) available on premises, the fire department and local Emergency room.	20	
11. Have local fire and police officials been kept apprised of the operations and the materials handled at your location? (e.g., new chemicals, lines, processes?)	10	
12. Is there an adequate written inspection program to insure the operable condition of all emergency equipment such as alarm, exit lights, fire protection and prevention equipment, communication systems, etc.?	15	

TOTAL POSSIBLE = 200
SCORE: _____ _____%

Additional Comments:

MAINTENANCE DEPARTMENT FUNCTIONS

Criteria	Rating	Comments
1. Is there a written scheduled preventive maintenance program?	20	
2. Does it include checking and testing of safety guards such as safety interlocks, and valves, removable machine guards, ventilation, grounding controls and alarms, welders, condition of electrical distribution centers, etc?	20	
3. Does a review of the program requirements and the records verify compliance with the program?	15	
4. Do maintenance personnel participate in safety committee and other safety functions?	10	
5. Is priority given to safety related maintenance items? Are they corrected within 24 hours or a plan made for correction?	20	
6. Does the Maintenance dept. apply OSHA/ANSI standards for the construction and application of machine guards that meet or exceed the OSHA standard?	15	

Additional Comments:

MAINTENANCE DEPARTMENT FUNCTIONS

Criteria	Rating	Comments
7. Are cranes and other hoisting equipment inspected according to the OSHA standard, which include daily, weekly, and annual inspections. Is this done by an outside qualified personnel with results properly documented?	10	
8. Are supervisors and employees satisfied with the maintenance of their machines? Would these concerns affect safety?	5	
9. Do enforced safety rules for maintenance personnel include:	20	
(a) Use of personal protective equipment?		
(b) Working in confined spaces?		
(c) Welding and cutting permits?		
(d) Lockout procedures?		
(e) Hazard Communication		
10. Do the Maintenance department employees have a good knowledge of accepted safety practices and legal requirements? (Machine guarding, hoist program, hot work permits, etc.)	10	

TOTAL POSSIBLE = 145
SCORE: _____ _____%

Additional Comments:

ACCIDENT INVESTIGATION AND STATISTICS

Criteria	Rating	Comments
1. Are accidents reported promptly? (within 8 hours to the safety office) And is the investigation conducted immediately?	20	
2. Are written investigations determining cause and possible corrective measures completed on:		
(a) First-aid injuries?	25	
(b) OSHA recordable and Lost time injuries?	25	
(c) Accidents not involving injury (near miss)?	25	
(d) Unsafe acts of a repetitive nature?	25	
3. Are investigation reports reviewed by department managers and signed?	20	
4. Are suggested corrective measures completed? Is there a paper trail to follow for major items?	20	

Additional Comments:

ACCIDENT INVESTIGATION AND STATISTICS

Criteria	Rating	Comments
5. In the accident investigation, is consideration given to possible deficiencies in the following: Are they complete/thorough?		
(a) Management policy?	15	
(b) Effectiveness of Supervisors?	15	
(c) Training of Supervisors?	15	
(d) Employee selection and training?	15	
(e) Design of equipment layout, work procedures?	15	
(f) Selection of material and processes?	15	
6. Are accident repeaters being counseled and/or disciplined for unsafe acts as necessary?	10	
7. Are plant-wide accident frequency and severity statistics maintained and updated as needed?	20	
8. Are accident statistics maintained on a departmental basis in order to establish trends, identify problem areas, etc.?	20	

Additional Comments:

ACCIDENT INVESTIGATION AND STATISTICS

Criteria	Rating	Comments
9. Are all employees kept aware of the accident experience compiled by the plant and their departments?	15	
10. Are the OSHA 200 logs consistent with published guidelines from the Department of Labor?	250	
11. Does supervisory staff investigate accidents and near miss incidents which occur to employees directly under their supervision and are these investigations reviewed by department managers? Does the documentation of these reviews exist?	20	
12. Is property damage, that does not entail injury, investigated and actions taken?	20	

TOTAL POSSIBLE = 605
SCORE: _____ _____%

Additional Comments:

Written Safety Programs

Criteria	Rating	Comments
1. Are program documents that exist ISO compliant or use a systems approach? a. Controlled documents? b. Signed off by affected department	20	
2. Is there a document depicting the program, training for that program, and inspections for that program? a. Confined space program specific) c. Electrical safety d. Fire safety and evacuation e. Hazard Communication f. Hoist safety g. Forklift program h. JSA's for each area or similar vehicle for explaining how to safely perform a task i. Welding safety j. Radiation protection program k. Lab safety program (lab only) l. Hazardous waste removal systems. m. How to report a hazard n. Personal protective equipment that includes a 'certified' survey of hazards? o. Industrial Hygiene with levels measured against OSHA PEL and/or ACGIH TLV's? p. Ergonomics q. Contractor safety r. Respiratory Protection s. Emergency Response	250	

Additional Comments:

Written Safety Programs

Criteria	Rating	Comments
3. Are employees knowledgeable about the following programs? As determined by questions or results of inspections conducted in the facility-see question 2 (inspections).	250	
a. Confined Space		
b. Lockout/Tagout		
c. Electrical Safety		
d. Fire Safety/Evacuation		
e. Hazard Communication		
f. Hoist Safety		
g. Forktruck Program		
h JSA's for their area		
i. Welding Safety (Hot Work)		
j. Radiation		
k. How to Report a Hazard		
l. Lab Safety (Lab employees only)		
m. Hazardous Waste Removal procedures		
n. PPE		
o. Orientation (New Employees only who have worked <1 year)		
p. Levels of noise, radiation, or chemicals from the most recent plant tests.		
q. Grounding and bonding during dispensing of chemicals.		
r. MSDS sheets and where to locate them.		
Additional Comments:		

Written Safety Programs

Criteria	Rating	Comments
SAFETY ISSUE MANAGEMENT:		
4. Are safety issues determined by the following sources (provide supporting evidence)?		
a. Employee Concern?	15	
b. Safety Manager Observation?	15	
c. Supervisor Observation?	15	
d. Manager Observation?	15	
e. Accident with Injury Reports?	15	
f. Near Miss Reporting?	15	
5. Do these issues show evidence of being tracked and managed to resolution?		
a. Closure dates established?	10	
b. Person responsible for resolution assigned and aware of assignment?	10	
c. Past file of completed issues?	10	
d. Money or resources allocated?	10	
6. Are the hourly employees involved in the resolution of the safety issues?	50	
7. Is accountability for using the safety systems reflected in the manager and supervisory performance evaluations?	100	
8. Ergonomics		
a. Have ergonomic issues been identified?	100	
b. Is there a control plan in place to solve ergonomic problems?	100	
c. Is there evidence of the success of the control plan?	100	

TOTAL POSSIBLE = 1100
SCORE: = _____ _____%

Additional Comments:

SAFETY PROGRAM RESULTS

Criteria	Rating	Comments
1. Has the lost time case incident rate decreased by 25% over last year?	150	
2. Have the number of lost workdays per 1000 hours worked, decreased in comparison to last year? Has the plant met their own established goals?	100	
3. Are the current Workers Compensation costs less than or equal to the previous years costs?	300	
4. Has the overall case count on OSHA recordables fallen or is below your established goal from the previous year?	300	

TOTAL POSSIBLE = 850
SCORE: = _____ _____%

Additional Comments:

Safety Program
Self Assessment
Credits

CRITERIA	ATTAINED	POSSIBLE
Line Management Involvement		795 pts.
Hazard Control and Inspections		430 pts.
General Safety Procedures		95 pts.
Safety Training and Awareness		210 pts.
Housekeeping		295 pts.
Safety Committee Activity		90 pts.
Fire Prevention and Protection		240 pts.
Emergency Planning		200 pts.
Maintenance Department Functions		145 pts.
Accident Investigation and Statistics		605 pts.
Written Safety Programs		1100 pts.
Safety Program Results		850 pts.
TOTAL		5075 pts.

General comments:

TABLES

TABLE 1
Tyco's Safety Audit

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Property Loss Control
Refer to Best Practice checklists contained in the PLC manual

Criteria	Value and comments	Clarifying comments on criteria
1. Does a drawing exist showing area layouts, hazards, exits, is it up to date and is it posted?	Potential=25	Also known as emergency evacuation routes, drawings need to be posted in work areas and local fire dept. needs a copy.
2. Does this location meet all criteria listed at the "managed level" checksheets listed in the PLC manual?	Potential=250	For a free copy of this manual, please contact Tyco Risk Management. All sheets and supporting data are contained in this manual.
3. Are fixed and portable fire extinguishers inspected and maintained as outlined by N.F.P.A. standards (annually by outside vendors and more frequent internally)?	Potential=15	Refer to standard.
5. Is there a program for the care and maintenance of sprinkler systems and are records maintained of design, performance and maintenance checks?	Potential=20	
6. Are fire alarm and fire door systems inspected and maintained?	Potential=20	
7. ***Please note: If there are no outstanding recommendations on the previous Factory Mutual report and no significant changes have occurred since the last visit, full value will be given in items 2 and 5.***		Factory Mutual engineering services are free to the location. If you would like to have a visit or a copy of the last report on your location, please call Tyco Risk Management at (603) 778-9200. You may use FM engineers to assist you in completing these check sheets. If outstanding recommendations exist and cannot be complied with based on inherant limitations in the locations please call Tyco Risk Management to discuss removal of these items from your outstanding item listing. An example would be the situation in which there is an inadequate water supply for the hazard. If water is not available anywhere on site, then this recommendation will NOT affect scoring on this criteria.

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SYSTEMS

Criteria	Value and comments	Clarifying comments on criteria
1. Are program documents that exist ISO compliant or use a systems approach? a. Controlled documents? b. Signed off by affected department managers	Potential=20	A systems approach would include the source document, training, and inspection documents that have dept. mgr review and signature?
2. Is there a document depicting the program, training for that program, and inspections for that program? a. Confined space program b. Lockout tagout program (machine specific) c. Electrical safety d. Fire safety and evacuation e. Hazard Communication f. Hoist safety g. Forklift program h. JSA's for each area or similar vehicle for explaining how to safely perform a task i. Welding safety j. Radiation protection program k. Lab safety program (lab only) l. Hazardous waste removal systems. m. How to report a hazard n. Personal protective equipment that includes a 'certified' survey of hazards? o. Industrial Hygiene with levels measured against OSHA PEL and/or ACGIH TLV's? p. Ergonomics q. Contractor safety	Potential=250	Put N/A beside those that do not apply. For JSA's: This is not expected to be all encompassing since it evolves as work evolves. However, some need to be done.

SAFETY PROGRAM RESULTS

Criteria	Value and Comments	Clarifying comments on criteria
1. Has the lost time case incident rate decreased by 25% over last year or is it 50% of the SIC code?	Potential=150	
2. Have the number of lost workdays per 1000 hours worked, decreased in comparison to last year?	Potential=100	
3. Are the current costs less than or equal to 1/2 of the baseline obtained in ____yr losses.	Potential=300	
4. Has the overall case count fallen to or below the established goal of 50% of the SIC code average?. For every 5% below the 50% SIC mark add 100 points.	Potential=300 Half score for being below the national average.	

TOTAL POSSIBLE = 850
SCORE: = _____ _____%

TABLE 2
Rater's Response Form

Section 1

Line Management Involvement

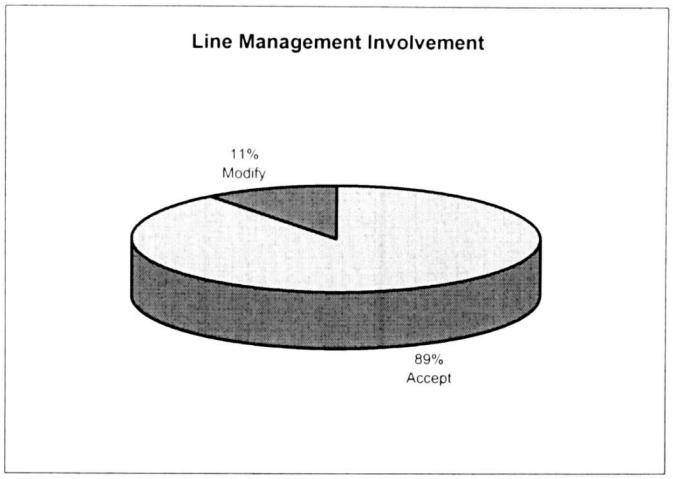
Item #	Reader	Accept	Modify
1	1		X
	2	X	
	3	X	
	4	X	
	5	X	
2	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
3	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
4	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
5	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
6	1		X
	2	X	
	3	X	
	4	X	
	5	X	
7	1	X	
	2	X	
	3	X	
	4		X
	5	X	
8	1	X	
	2	X	
	3	X	
	4		X
	5		X

Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

Section 1

Line Management Involvement

Item #	Reader	Accept	Modify
9	1		X
	2	X	
	3	X	
	4		X
	5	X	
10	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
11	1		X
	2	X	
	3	X	
	4	X	
	5	X	
12	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
13	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
14	1		X
	2	X	
	3	X	
	4	X	
	5	X	
15	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
16	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
17	1	X	
	2	X	
	3	X	
	4	X	
	5	X	

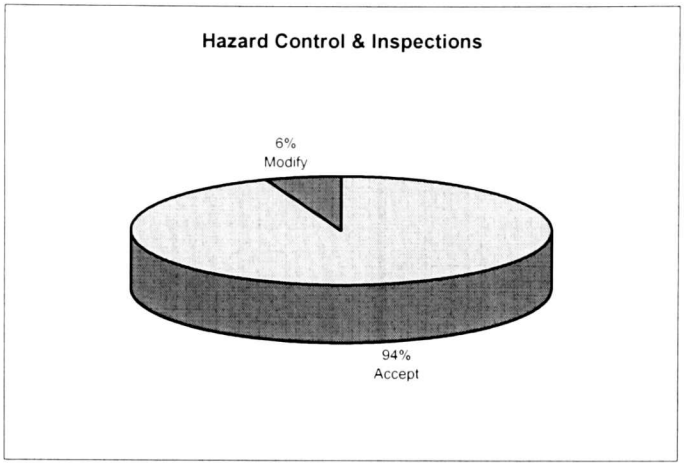


Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

89% % Accepted
11% % Modified

Section 2
Hazard Control and Inspections

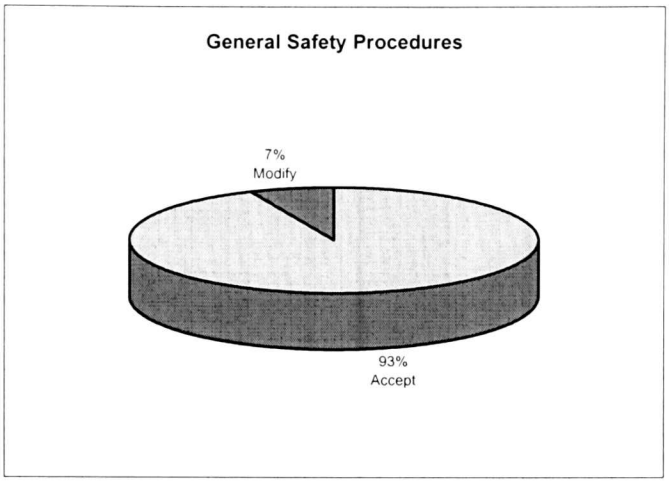
Item #	Reader	Accept	Modify
1	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
2	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
3	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
4	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
5	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
6	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
7	1	X	
	2	X	
	3		X
	4		X
	5	X	



Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis 94% % Accepted
Reader 3. - Mr. Mike Shea 6% % Modified
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

Section 3
General Safety Procedures

Item #	Reader	Accept	Modify
1	1	X	
	2	X	
	3	X	
	4	X	X
	5		X
2	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
3	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
4	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
5	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
6	1	X	
	2	X	
	3	X	
	4	X	
	5	X	

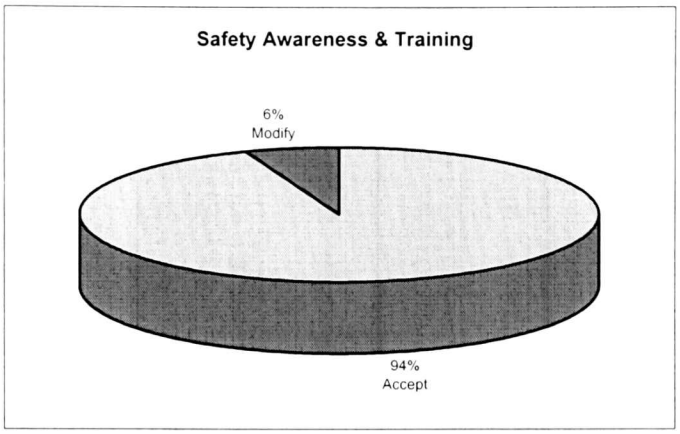


Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

93% % Accepted
7% % Modified

Section 4
Safety Training and Awareness

Item #	Reader	Accept	Modify
1	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
2	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
3	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
4	1		X
	2	X	
	3	X	
	4	X	
	5	X	
5	1		X
	2	X	
	3	X	
	4	X	
	5	X	
6	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
7	1	X	
	2	X	
	3	X	
	4	X	
	5	X	



Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

94% % Accepted
6% % Modified

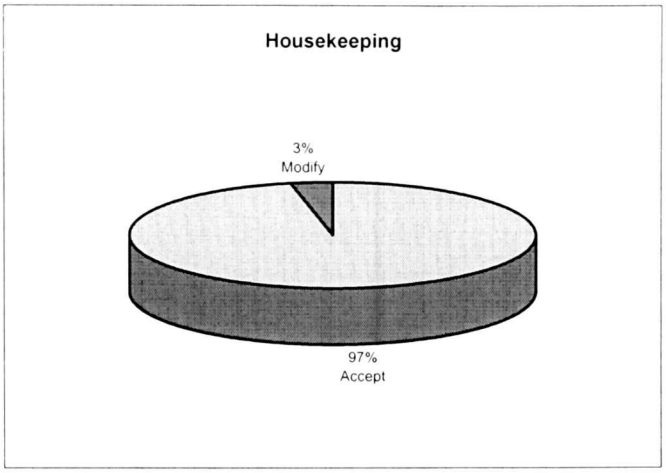
Section
Housekeeping 5

Item #	Reader	Accept	Modify
1	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
2	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
3	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
4	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
5	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
6	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
7	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
8	1	X	
	2	X	
	3	X	
	4	X	
	5	X	

Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

Housekeeping

Item #	Reader	Accept	Modify
9	1		X
	2	X	
	3	X	
	4	X	
	5	X	
10	1		X
	2	X	
	3	X	
	4	X	
	5	X	
11	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
12	1	X	
	2	X	
	3	X	
	4	X	
	5	X	



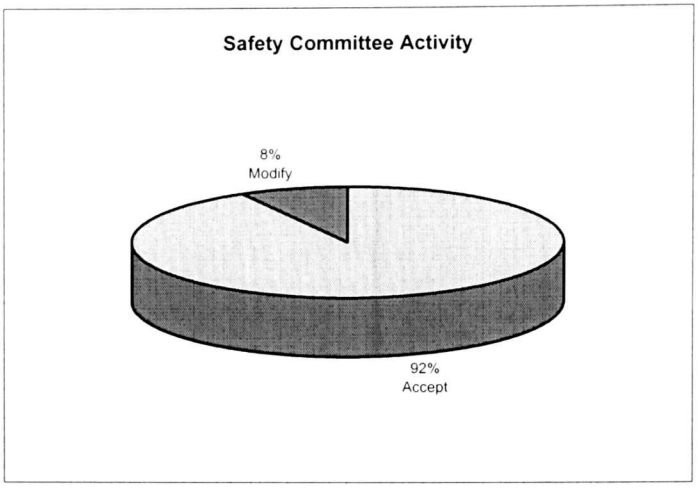
Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

97% % Accepted
3% % Modified

Section 6

Safety Committee Activity

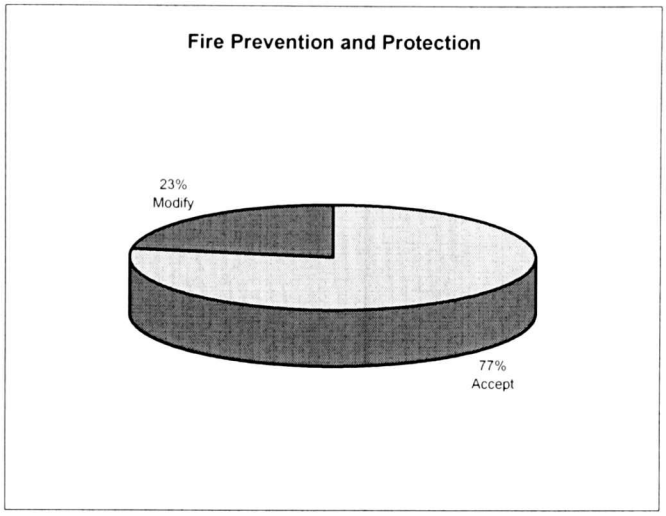
Item #	Reader	Accept	Modify
1	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
2	1	X	
	2	X	
	3	X	
	4	X	
	5		X
3	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
4	1	X	X
	2	X	
	3	X	
	4	X	
	5	X	
5	1	X	
	2	X	
	3	X	
	4	X	
	5	X	



Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis 92% % Accepted
Reader 3. - Mr. Mike Shea 8% % Modified
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

Section 7
Fire Prevention and Protection

Item #	Reader	Accept	Modify
1	1	X	
	2	X	
	3	X	
	4		X
	5	X	
2	1	X	
	2	X	
	3		X
	4	X	
	5		
3	1	X	
	2	X	
	3		X
	4	X	
	5		
4	1	X	X
	2	X	
	3	X	X
	4	X	
	5	X	
5	1	X	
	2	X	
	3	X	
	4	X	
	5		X
6	1	X	
	2	X	
	3	X	
	4		X
	5		X
7	1	X	
	2	X	
	3	X	
	4	X	
	5		X
8	1	X	
	2	X	
	3	X	
	4	X	
	5	X	



Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

77% % Accepted
23% % Modified

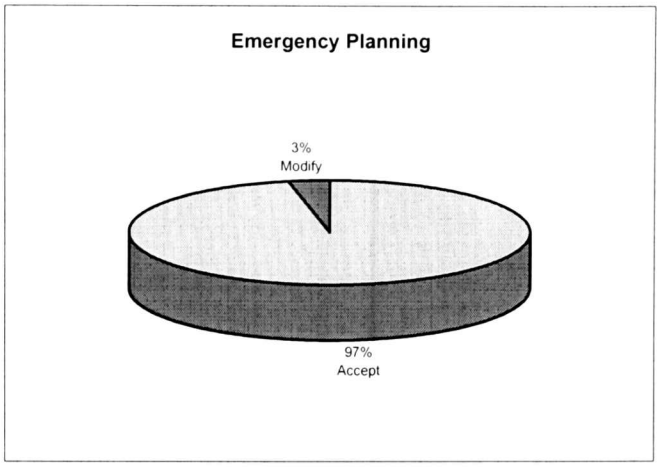
Section 8
Emergency Planning

Item #	Reader	Accept	Modify
1	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
2	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
3	1		X
	2	X	
	3	X	
	4	X	
	5	X	
4	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
5	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
6	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
7	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
8	1	X	
	2	X	
	3	X	
	4	X	
	5		X

Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

Section
Emergency Planning

Item #	Reader	Accept	Modify
9	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
10	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
11	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
12	1	X	
	2	X	
	3	X	
	4	X	
	5	X	



Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

97% % Accepted
3% % Modified

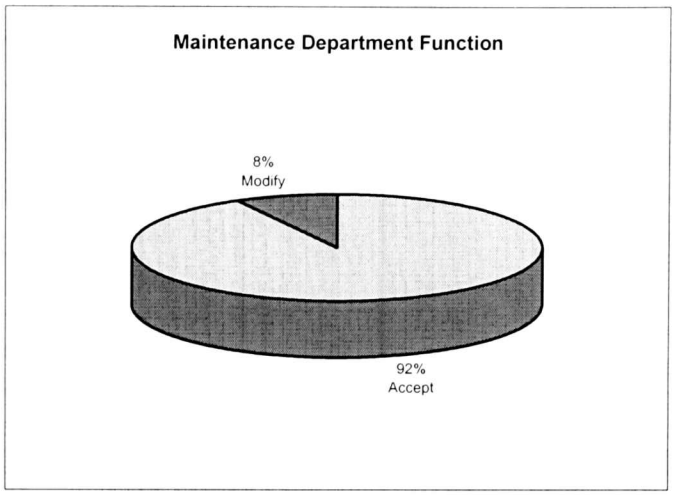
Section 9
Maintenance Department Functions

Item #	Reader	Accept	Modify
1	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
2	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
3	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
4	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
5	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
6	1	X	
	2	X	
	3		X
	4	X	
	5	X	
7	1	X	
	2	X	
	3		X
	4		
	5	X	
8	1	X	
	2	X	
	3	X	
	4	X	
	5	X	

Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

Section
Maintenance Department Functions

Item #	Reader	Accept	Modify
9	1		X
	2	X	
	3	X	
	4	X	
	5		X
10	1	X	
	2	X	
	3	X	
	4	X	
	5	X	



Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis — 92% % Accepted
Reader 3. - Mr. Mike Shea — 8% % Modified
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

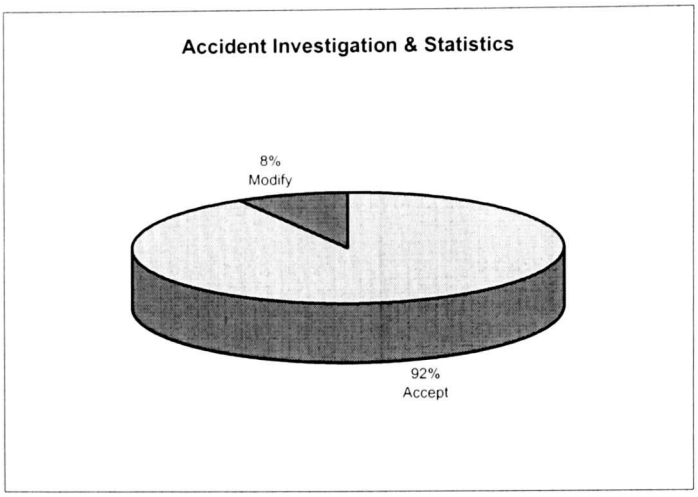
Section 10
Accident Investigation and Statistics

Item #	Reader	Accept	Modify
1	1		X
	2	X	
	3		X
	4	X	
	5	X	
2	1	X	
	2	X	
	3	X	
	4	X	
	5	X	X
3	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
4	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
5	1	X	
	2	X	
	3	X	
	4	X	
	5		X
6	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
7	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
8	1	X	
	2	X	
	3	X	
	4	X	
	5	X	

Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

Section
Accident Investigation and Statistics

Item #	Reader	Accept	Modify
9	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
10	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
11	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
12	1	X	
	2	X	
	3	X	
	4	X	
	5		X



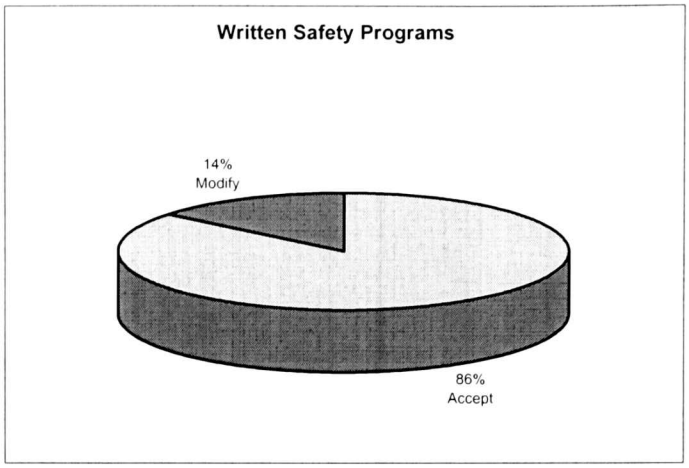
Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis
Reader 3. - Mr. Mike Shea
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

92% % Accepted
8% % Modified

Safety Self-assessment Rating Form

Section 11
Written Safety Programs

Item #	Reader	Accept	Modify
1	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
2	1	X	X
	2	X	
	3	X	
	4	X	
	5	X	
3	1		X
	2	X	
	3	X	
	4	X	
	5		X
4	1	X	
	2	X	
	3	X	
	4	X	
	5		X
5	1	X	
	2	X	
	3	X	
	4	X	
	5		X
6	1	X	
	2	X	
	3	X	
	4	X	
	5	X	
7	1	X	
	2	X	
	3	X	
	4	X	
	5	X	



86% % Accepted
14% % Modified

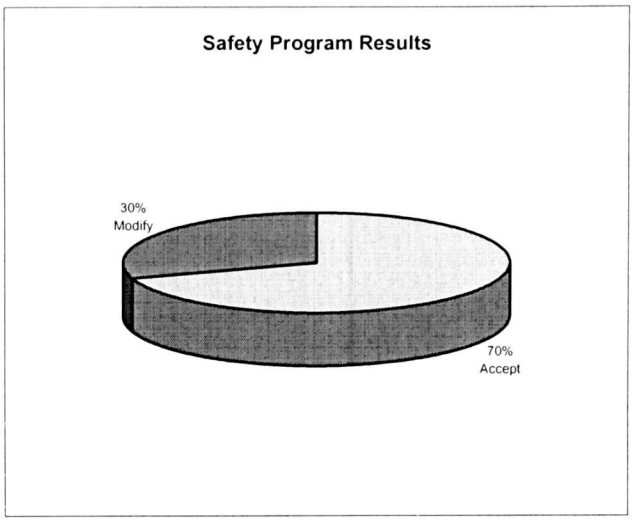
Reader 1. - Reader 1. - Dr. Dennis Zeimet
Reader 2. - Reader 2. - Mr. Randy Lewis
Reader 3. - Reader 3. - Mr. Mike Shea
Reader 4. - Reader 4. - Mr. Charles Harris
Reader 5. - Reader 5. - Mr. Tim O'Donald

Safety Self-assessment Rating Form

Section 12

Safety Program Results

Item #	Reader	Accept	Modify
1	1	X	
	2	X	
	3	X	
	4		X
	5	X	
2	1	X	
	2	X	
	3	X	
	4		X
	5		X
3	1	X	
	2	X	
	3	X	
	4		X
	5		X
4	1	X	
	2	X	
	3	X	
	4		X
	5	X	



Reader 1. - Dr. Dennis Zeimet
Reader 2. - Mr. Randy Lewis — 70% % Accepted
Reader 3. - Mr. Mike Shea — 30% % Modified
Reader 4. - Mr. Charles Harris
Reader 5. - Mr. Tim O'Donald

TABLE 3
Types of Suggested Modifications

Table 3
Types of Suggested Modifications